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# Polygraph Testing on Deaf People and the Impact of Linguistic Accessibility

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## Abstract

The purpose of this comparative research study was to examine the effectiveness of a polygraph examination for deaf participants with and without American Sign Language (ASL). A study like this has not been conducted and the research literature is mixed on the importance of having a signed language interpreter when polygraph examinations are being conducted on deaf participants. With the current emphasis on 'best practices', it is imperative to take a close look at the concept of linguistic accessibility and clarify some of the issues associated with the polygraph testing procedures for deaf individuals. Improper procedures can result in wrongful convictions or in deaf individuals not being hired for positions due to inaccurate polygraph results. For this paper, a triangulation-design-mixed-methods research study was conducted in two locations in Pennsylvania in two phases with a certified polygraph examiner. In Phase I, a group of deaf participants took the polygraph examination without an interpreter present. In Phase II, the same group returned and went back through the polygraph process with a certified legal interpreter. The researchers used the phenomenological approach for the qualitative portion of the study. The participants were interviewed and asked to provide their experiences and insights; it became clear from the pattern of interview responses that an interpreter is needed to ensure effective communication during the polygraph examination process, which helps validate the concept of linguistic accessibility. The qualitative findings have links to the study's quantitative portion related to how many participants completed the polygraph examination. The provision of an interpreter makes a dramatic difference in this outcome as compared to an examination without any use of ASL.

## Introduction

Deaf people are known for being signers and those residing in the United States and parts of Canada are likely to be proficient in American Sign Language (ASL). The deaf community is found to demonstrate ethnic-like qualities with Deaf culture being maintained through the use of ASL over a long history (Lane, 2005; Lane, Pillard, & Hedberg, 2011). At the same time, deaf people are part of the larger society that may require them to undergo a polygraph examination. The polygraph examiner is normally a non-signer and asks questions in spoken English as part of the test administration. The examinees hear the questions and respond accordingly. With deaf people, little is known about how communication affects polygraph testing.

Linguistic accessibility is a rather new concept that offers a theoretical foundation for how deaf people best perform in the communicative domain over varied settings, including that of polygraph test taking. While ASL and English may be seen as two languages used with deaf people, the frequently held perception is that these two languages enjoy 'equal' status. However,

[1] Jessica Bentley-Sassaman and Kelly Roth would like to acknowledge Kristin Lizor for the research idea and for her part in the data collection process. The majority of this article was written by Jessica Bentley-Sassaman and Kelly Roth respectively.

this notion is too simplistic and can cause a number of misunderstandings. The fact that ASL is a signed language (whereas English is not) must not be overlooked. Not only does ASL possess its own structure (e.g., phonological, morphological, and syntactic) in comparison to English or any spoken language, this language is tuned to the visual/gestural modality. This results in young deaf children acquiring and mastering ASL with ease. The ease of communication through ASL also occurs among deaf children and adults. English is a different matter as it operates in a far less accessible spoken language modality. Deaf people may manage to learn to read and write in English as their second language, but ASL remains their language of choice (Supalla & Cripps, 2008; see Cripps & Supalla, 2012 for further discussion on the linguistic accessibility issues for deaf people).

What seems to be critically important for taking a polygraph test is the recognition of ASL as deaf people's language. This means that if at any time hearing people engage in oral language discourse by speaking and hearing English as found during the polygraph testing procedure, deaf people need to do the same through signing and watching, with ASL for effective participation. The fact that a polygraph examiner is most likely a non-signer should not be seen as a barrier for deaf people in taking the exam. The employment of a certified legal interpreter to sign what the polygraph examiner has to say can serve as an effective compensation for the deaf examinee.

Unfortunately, the needs of deaf people are not widely understood in the context of hearing society. Hearing people are prone to take for granted the language and communication issues that affect the administration of the polygraph test with deaf people. A typical question posed to a deaf individual upon encountering a hearing person for the first time is: "Can you read my lips?" with exaggerated mouth movements. While the deaf individual may be able to understand the question, they are inclined to shake their head to say 'no' for reasons of linguistic accessibility. The hearing person may be perplexed at the deaf person's negative answer or over what to do next. This communication breakdown has roots in the hearing person's naive presumptions and outlook on what language means for deaf people. This includes the thought that making English visual through speech reading (also referred to as lipreading) is all that is required for achieving effective communication. Speech reading is when a person with a hearing loss is expected to understand communication that is made on the lips, to read the lip movements of the speaker. McAleer (2006) found that even highly skilled lip-readers can only capture approximately 30 to 40% of the message (this percentage does not assume they understand the meaning of the words), while the majority rely on either guesswork or pretending to understand what is being said to them.

What may be surprising for readers of this paper is how the level of academic understanding about the polygraph examination and deaf people is not where it should be. The case for linguistic accessibility may be strong, but the research literature is not clear on ASL. It is necessary to review the literature and understand how ambiguity prevails in regard to deaf people's language and communication needs. It will be seen that addressing the best platform for performing the polygraph examination with deaf people is not necessarily a priority. This explains, in part, why a new research study has been undertaken for this paper.

## Literature Review

Polygraph testing occurs in various settings and among various populations, and deaf people are included. Polygraph tests are conducted during law enforcement investigations, probation and parole, pre-employment screening, and in the private sector. Pre-employment polygraph testing involves exploring the candidates' prior job history, substance abuse, and

criminal behavior (Orr, 2015). During the administration of the polygraph test, the examiner will ask a number of questions. Hearing these questions is an important asset, but, obviously, deaf people will not be able to do so. The consequences can be serious. Polygraph examinations not conducted in the proper manner with deaf individuals may unjustly disqualify them from holding high security jobs or clearances, or may bring the individual to face unjust criminal sanctions, for example.

Employing a certified legal ASL interpreter to help ensure that deaf individuals participate in the polygraph testing process effectively may be the most sensible action to undertake. Some researchers felt it valuable to consider using interpreters and others did not. More than one researcher suggested that that deaf individuals could participate in the polygraph testing process without the use of any interpreter. As part of better understanding the issues associated with the polygraph testing and deaf people, it is necessary to become familiar with the Silent Answer Test (SAT) method. The SAT requires the examinee to silently answer the question to him/herself when undergoing a polygraph examination (Horvath & Reid, 1972). The polygraph examination measures the body's response to questions, not the answer itself. The examinee will need to sit on a sensor pad, which is designed to detect the use of countermeasures to defeat the polygraph examination by changing their physiological reactions. This method has been examined in over 4,000 specific issue cases concerning hearing people (Horvath & Reid, 1972).

## Polygraph Testing of Deaf Individuals without an Interpreter

The presumption of effective function of speechreading can be identified as a flaw in the work of researchers who examined the use of polygraphs with deaf people without any consideration for ASL. This coincides with a negative attitude of these researchers towards interpreting. For example, Matte (1980; 1996) cited interpreters as being biased, yielding to bribes/blackmail, and being loyal to the deaf polygraph test participants, thus skewing their responses. This assessment may be true when a co-worker or a family member is asked to help facilitate communication between the polygraph examiner and the examinee. The potential level of bias with a professional interpreter is likely to be different, however.

Matte's 1980 and 1996 research studies investigated the particular approach that the researcher himself developed in 1974 for working with deaf people. A 3x5 card was placed next to the examinee's right hand so that his/her arm would not move. The examinee could then tap the card, which had various colored plus symbols to represent *yes* and various negative symbols to answer *no*. The color of the symbol would be worked into the question so that the examinee would know which color plus or negative symbol to touch. One deaf individual who participated in Matte's studies was instructed to read the polygraph examiner's lips. Matte explained that his approach was found to be "effective in eliminating countermeasure attempts by the subject, and the need for an interpreter" (1980, p. 149).

Shurany and Chaves (2013) had similar reservations about the use of interpreters for deaf individuals. These researchers, like Matte, asked one deaf individual who participated in the study to read the polygraph examiner's lips. Shurany and Chaves' approach to administering the polygraph is different from Matte's. The deaf examinee performed absolutely silent responses (i.e., just thinking about whether to say yes or no). Shurany and Chaves cited research with the SAT method where testing utilized a positive control technique where, in an exam, the examinee was to "first answer with a subjective lie and then with a subjective truth" (p. 71). To the researchers,

this approach was productive; therefore, they concluded that they were successful in utilizing the SAT with deaf people.

For this paper, the use of only a single deaf individual in the two studies subject to review suggests a problem of its own. It is possible that the participants have outstanding talent and serve as an exception to the rule by being 'fully functioning lipreaders'. If this is the case, the studies do not represent the deaf population in the United States and Canada. The avoidance of ASL for polygraph testing research must also be questioned. If deaf people are known for being signers, it should have been embraced as an alternative linguistic and communicative behavior as part of the diversity and differences that prevail throughout society. The lack of knowledge regarding ASL interpreters by the researchers seems to have set them on a course of formulating unnecessary measures, including having deaf individuals engage in speechreading.

Up to now, the practice of using speechreading for deaf people to undergo a polygraph examination has not been challenged, at least explicitly. Ansley (2008) raised the concern about how deaf examinees must physically face the polygraph examiner for speechreading purposes. This allows the examinees to see the examiner's reactions to the chart and to the examinee's replies. This experience for the deaf examinees could skew the results. The fact that hearing examinees are not allowed to watch the examiner's face suggests the importance of this practice. The bigger problem pertains to linguistic accessibility. ASL is known to be deaf people's language and the fact that ASL is a signed language seems to have been overlooked.

**Polygraph Testing of Deaf Individuals with an Interpreter**

The first known scholarly publication on the use of an ASL interpreter for polygraph testing is Wagner (1979). This researcher utilized an interpreter for his polygraph examination study, and he noted that this "method of testing can be efficient, complete and most of all, conclusive" (p. 256). Wagner also made the effort to state the importance of employing a competent interpreter, such as a certified legal interpreter. A certified legal interpreter is bound by confidentiality, and the examinee should be made aware of the interpreter's requirement to maintain confidentiality. The researcher added that when an interpreter is utilized, the examinee will not be facing the polygraph examiner (thus avoiding the potential problems associated with reading the examiner's facial expression). The fact that Wagner recommended that the interpreter does not have a prior relationship with the examinee is appropriate.

Ansley's later 2008 study provides substantial information on the value of an ASL interpreter for conducting polygraph examinations with deaf people. Specifically, the Vermont State Police successfully polygraphed a 23-year-old deaf sexual assault victim. The person interpreting was not a trained interpreter, but a principal at a school for the deaf who knew how to sign. The deaf examinee in this case was allowed to answer yes or no by either slightly nodding or shaking the head. Ansley noted that the Vermont State Police "took adequate time for preparation, obtained assistance, and completed the examination" (p. 13).

The fact that the Vermont polygraph scenario did not have a trained interpreter must be noted as a problem. In this case, however, the principal was likely fluent in ASL and may have had a significant amount of informal interpreting experiences. Not all hearing signers are fluent or have the skills associated with interpreting. Once again, Ansley as the researcher of the study emphasized that it is crucial that an interpreter has the proper training in the skill of interpretation and decision making processes (such as the Demand Control Schema: see Dean, 2014), and in the

understanding of the Registry of Interpreters for the Deaf (RID) Code of Professional Conduct (RID, 2004).

In another study, Roberson, Russell, & Shaw (2011) conducted a study on legal interpreters in North America and noted that interpreters who have taken specialized legal interpreter training and who have "appropriate qualifications" are "better equipped and prepared to handle the complexities of language and dynamics of the courtroom" (p. 67). If an interpreter is inadequate to interpret in the legal setting, perhaps due to lack of training, there could be "dire consequences for the [d]eaf litigants and defendants" (p. 67). The lack of training and understanding of legal terminology, courtroom dynamics, processes and protocols can lead to misunderstandings and misinterpretations. What has been described for the legal setting in general is similar to the polygraph examination in terms of gravity and seriousness. Interpreters with specific qualifications must be used concerning deaf people.

For the polygraph testing research with deaf people as a whole, researchers have conflicting opinions about how to conduct the examinations. This remains a serious problem. There are researchers advocating speechreading alongside those who advocate ASL and interpreting, without any conversations between the two groups. It appears that this lack of communication across the field is preventing researchers from investigating what is best for deaf people in regard to taking the polygraph test. For the best results, communication options must be made available for deaf people. At first glance, providing deaf individuals a choice between speechreading and ASL may seem appropriate, but we need to proceed thoughtfully. The research community needs to take one step back and think about how hearing individuals do not have a choice when it comes to spoken language modality use for the polygraph examination. Moreover, the test is given in English with English speakers. The same holds true for Spanish or any other spoken language. With deaf people, ASL should be used in administration, like any other language.

In addition, the research community needs to think carefully about the impact of its work on society at large. With the current research, if someone were to look up literature on how best to administer a polygraph examination to a deaf individual, they would likely uncover confusion surrounding the topic. This is not a good outcome of research. The appropriate and much needed question for research is thus: What constitutes the best practice concerning the polygraph testing procedure for deaf people?

## Methods

The study undertaken in this paper represents a new direction for polygraph testing research with deaf people. The investigation attempts to address the question of best practice and provide evidence on the effectiveness of ASL and interpreting as compared to speechreading with English. The design of having members of the deaf community undergo the polygraph examination with and without an ASL interpreter is unprecedented and should produce insightful results. For Phase I of the study, deaf participants were expected to read the polygraph examiner's lips for most of the time, along with notetaking with the polygraph examiner, if needed, for example. For Phase II of the study, the same group of participants took the exam again, this time, with the provision of an interpreter. The participants could watch ASL in use. The participation of multiple deaf people in the study helps contribute to the credibility of the findings and conclusions on linguistic accessibility as compared to the use of one participant, for example.

This research project was approved through the Bloomsburg University Institutional Review Board, serial number 2016-46. The research team consisted of three faculty members from

Bloomsburg University who are also authors of this paper. Two were from the ASL/English Interpreting Program. One from the interpreting program was hearing and a nationally certified interpreter through the RID, who also held the Specialty Certificate: Legal. The other was a deaf faculty member who is natively proficient in ASL and who had prior experience working as a deaf interpreter as well as experience in research with deaf participants in the criminal justice system. The third research team member was a faculty member from the Criminal Justice Program, who had no previous experience with deaf populations and did not know ASL. The study also utilized a certified polygraph examiner as well as a nationally certified legal interpreter. This interpreter was responsible for interpreting for the polygraph examiner during Phase II of the study only and was not present during Phase I.

The mixed method design of this study is best described as triangulation in nature. In line with Creswell (2005), both the qualitative and quantitative data were collected simultaneously in this type of mixed methods research. For this article, the qualitative portion is the focus. Creswell identified three characteristics of triangulation design as follows:

- The mixed methods researcher gives equal priority to both quantitative and qualitative data.
- The mixed methods researcher collects both the quantitative and qualitative data simultaneously during the study.
- The mixed methods researcher compares the results from quantitative and qualitative analyses to determine if the two databases yield similar or dissimilar results (p. 514).

A phenomenological qualitative research design was utilized, to allow for people to describe their experiences related to a specific phenomenon (Polkinghorne, 2005; Shaw, Grbic, & Franklin, 2004). Phenomenology examines a particular situation in which people were involved and analyzes how the participants construct meaning from that situation and how that impacts the world around them. All deaf participants in this study had prior experience utilizing ASL interpreters, such as for medical appointments or staff meetings. However, the polygraph scenario was a new experience to all the participants, and thus the phenomenon of focus.

As an addition to the qualitative phenomenological approach of the study, the research team also examined how many participants completed the polygraph examination during Phase I as compared to Phase II as part of the quantitative study. This quantitative information sheds light on how the deaf participants performed in the study and is methodically tied to the qualitative information from their polygraph test taking experiences. The research team acknowledges that the participants undergoing the polygraph examination the second time may have a better chance of completing it regardless of the provision of the interpreter. Yet the comments made by the deaf participants could either confirm or deny the benefits of linguistic accessibility. If the qualitative findings favor the provision of a certified legal interpreter, the research team will accept that the interpreter serves as a variable that can improve the deaf participants' chances of completing the exam.

When scoring the polygraph charts, participants can have a No Significant Response (NSR), a Significant Response (SR) or a No Opinion (NO). The NSR indicates that the person passed the polygraph. A pass means that the scoring was a +3 or better in each column. A SR means that the scoring was -3 or greater in one of the sub-columns. The NO response indicates that there is not enough data to know if one passed or failed the polygraph examination. Examiners score the charts themselves. All the tests are quality controlled, and depend on the type of

polygraph. In a criminal investigation, for example, it would undergo another layer of quality control.

## Context of the Study

The research study took place in two different locations in Pennsylvania (PA): northeastern PA and in southeastern PA. For recruiting participants, the researchers distributed both a flyer and a video in ASL. These materials were sent to agencies and organizations connected with the deaf community. Information about the study was posted on Facebook, as well as sent through Glide and email. The research team was aware of the socio-cultural fact that the deaf community is close-knit and often wary. The questionnaires were very personal, engendering fear of being exposed. Many deaf individuals expressed discomfort with not using a nationally certified interpreter during Phase I of the study. However, they also expressed discomfort with the possibility of already knowing the nationally certified interpreter utilized in Phase II of the study. With the deaf community being small, and the number of interpreters even smaller, deaf people often encounter the same interpreters in different scenarios, which can at times be embarrassing. The deaf researcher had to assure the deaf participants that their names would not be shared, nor would any of their personal information be published, as they all were assigned pseudonyms for the study.

The contact information of the deaf researcher was on the recruitment flyer and in the ASL video. Individuals interested in participating in the study were directed to contact the deaf researcher via her work videophone, which is a device that simultaneously transmits and receives both audio and video signals over telephone lines allowing communication in ASL (Borth, 2011). Over 23 potential participants contacted the deaf researcher. These interested individuals were further vetted as follows: if these potential participants had seizures, were pregnant, using certain medications, under the influence, on probation, awaiting trial, and/or had heart complications, they could not participate in the study. Individuals who suffer from these conditions are not able to take a polygraph examination under normal circumstances as these factors could affect the physiological response. The researcher asked each contact about the excluding criteria. Eight of the people who were interested could not participate based on the excluding criteria. Others declined further involvement, being afraid that others in the deaf community would find out they participated in a polygraph examination.

## Participants

Initially, a total of 15 deaf participants met the criteria of not having any of the disqualifying medical/legal conditions. All 15 were invited to participate in the study. One participant had to withdraw prior to the study due to a medical emergency. The selected deaf participants were given a schedule for Phases I and II. The within-subjects design was chosen because the number of times taking the polygraph does not affect the result of the polygraph. For example, when polygraphs are given to law enforcement officers during the pre-employment testing it is possible that a candidate could take multiple polygraphs with little time in between testing. Moreover, fewer participants are needed in the within-subject design, it is less time-consuming, and has more statistical power (Jackson, 2012). Additionally, because we are using the same subject for both conditions, extraneous variables that are unique to the participants will not impact the results.

The 14 participants in the subject pool are six males and eight females, and they were from

the northeastern and southeastern regions of Pennsylvania. The participants' ages ranged from 22 to 70 years old, with the mean age of 43 and the median age of 47. Approximately 85% of the participants were white; one was Asian, and one was Hispanic.

The research team collected a series of language acquisition samples from the 14 participants by having them complete a booklet of questions for use during the polygraph exam provide a writing sample, provide their educational background, and communication preference. The language competency disclosed by the participants was as follows: eight were bilingual (competent in both English and ASL); four were semi-lingual (not proficient in either English or ASL). The situation for deaf people who are identified as semi-lingual is an important consideration as these individuals may not possess the full capacity for linguistic comprehension skills. They are not expected to communicate clearly using ASL without misinterpreting the information given to them (see Andrews, 2013 for further discussion on semi-lingualism among the deaf population). The last two deaf participants were bimodal/bilingual (can either speak or sign and are competent in English and ASL).

Finally, the research team examined the participants' educational level by inquiring about their academic achievements: five participants earned a high school diploma as their highest level of education; two participants attended trade school/some college credits; one participant was currently enrolled in an undergraduate program; 1 participant received a Bachelor's degree; 1 participant was currently enrolled in a graduate program; and 4 participants received a Master's degree.

**Study Procedures**

Prior to the study, the polygraph examiner emailed a copy of the Law Enforcement Pre-Employment Test examination booklet to the research team. As the team is comprised of one active law enforcement officer and two mandated reporters, certain questions had to be removed related to mandated reporting, to maintain the goal of this study of examining the communication process and not detecting previous criminal activity. Questions related specifically to employment in the law enforcement field were also taken out or modified to talk about work in general. Further modifications of wording were made to be more comprehensible to deaf individuals. One of the researchers who is deaf and holds a doctoral degree was involved in the modification of questions. After the questions were modified, the booklet was submitted for IRB approval and given to the polygraph examiner to use during the testing. The study took place in two different months, July (Phase I) and August (Phase II).

Prior to the study, the polygraph examiner met via conference call with the research team members to go over the process. During that time, the research team members who have experience working with deaf populations gave the examiner tips on how to communicate with those who have a hearing loss. One of the items that was discussed was facial hair. When a deaf person needs to read lips, facial hair makes it harder to see the lips. The examiner noted that he had recently shaved his beard and moustache to resolve this issue.

*Phase I*. The first phase of the study was conducted over a four-day period in both the northeastern location and the southeastern location of PA. The participants were able to choose which location they preferred. Prior to agreeing to participate, the participants were told that there would be no nationally certified interpreter present during the first phase and they had to speechread to understand the examiner throughout the process. When the participants arrived, they were greeted by a member of the research team who could communicate in ASL. The participants

were asked to fill out the pre-polygraph screening booklet prior to arrival. Some of the participants did fill this out beforehand, and some filled it out when they arrived. Participants were randomly assigned a number in order to protect their identity.

The participants were shown three videos in ASL; the first video explained the consent form for the researchers, the second, the video release form, and the third, the consent form of the polygraph examiner. In addition to the ASL videos, all the participants were also given each of the forms to read. The participants were able to choose the level of privacy that felt comfortable in relation to the video recording. Because the participants use ASL, which is a visual-gestural language, they had to be video recorded. Participants had the option of choosing who could see their videos based on the video release form, which gave them the following options: (1) very limited, such as only the research team could view, (2) expanded, such as clips of the videos could be shown at conferences, (3) and finally: still photos could be used in publications.

Once all the forms were signed, the participants began the pretest process with the polygraph examiner. All the polygraph examinations were conducted by the same certified polygraph examiner who utilized a calibrated polygraph machine. In the 22 years working as a polygraph examiner, the examiner had no prior experience working with the deaf community. During the polygraph examination in both Phase I and II, when the participants were hooked up to the machine, the participants used the Silent Answer Test protocol to answer the question posed by the polygraph examiner. This means that they did not communicate their answers by either vocalizing or in ASL, instead they simply thought of the answer.

During Phase I, the polygraph examiner had to come up with ways to communicate with the deaf participants. Starting with the pretest, the participant sat with the polygraph examiner and they went over the questions in the booklet. Some communication methods included: (1) pointing at the English words in the booklet, (2) writing back and forth, and (3) speechreading. Communicating with deaf people who typically use ASL to communicate was new to the polygraph examiner. He came up with various strategies to build rapport with the participants. The examiner asked the person about themselves, as most people like say good things about themselves. The chit chat was actually multifaceted as the examiner was listening and figuring out how to use what they were talking about to open up. The examiner noted that the "gift of gab" assists in doing this. The polygraph examiner noted that he engaged in more conversation with all of them than he may have with a non-deaf individual. However, he felt that it was not different from working with a non-deaf individual, just more time consuming. Developing rapport with someone who will be taking a polygraph examination is an integral part of the testing process.

When the pretest interview was concluded, the participants were given a break. Once the break was over, the participants then sat on a cushioned portable subject's chair on an activity sensor seat pad. A standardized blood pressure cuff with pump and bulb with gauge was attached to measure heart rate; two pneumo-chest assemblies, which measure the changes in respiration was placed on the chest and stomach; and a finger electrode was set to measure the electrodermal activity (EDA) with sensors that measure the changes in a person's perspiration. These pieces of equipment were then attached to the examiner's computer utilizing the Lafayette LX4000 computerized polygraph LX software 11.6.0. All examinations were video recorded by a camera set up by the research team (who were not present in the room at any time during the polygraph process) and the polygraph examiner. When the polygraph concluded, the participants took another break. Then the posttest was conducted to go over the process and to see if there were any questions. When the polygraph examination process was complete, the participants met with the deaf researcher to be interviewed about their experiences with the polygraph process. The

interview was video recorded, to visually capture the language used, ASL.

*Phase II*. The same participants from Phase I participated in Phase II. Upon arrival for Phase I participants were asked to choose their test date and time for their polygraph exam for Phase II. Phase II was conducted approximately one month after Phase I. The second phase took place in the same locations as Phase I. Phase II included the use of a nationally certified legal interpreter who was given the booklet ahead of time and who met with the polygraph examiner during Phase I to go over any questions that she had. The polygraph process was the same in Phase I and Phase II. All exams began with the pretest, which was going through the pre-employment polygraph booklet that the participants filled out in Phase I.

When the participants arrived, they did not need to view the videos again or fill out the consent forms. This time the participants were led back to the examiner and the pre-test began utilizing the same booklet from Phase I. The pre-test was now communicated using the interpreter who was from the southeastern part of PA. The interpreter travelled to the northeastern location for the first two days of testing. When the testing was concluded in this part of the state, the polygraph examiner, the interpreter for the polygraph examiner, the research team, and the interpreter for the deaf researcher traveled to the southeastern location for two more days of polygraph examinations.

The polygraph examiner commented that in Phase II rapport building was minimal as he was already familiar with the participants. When the polygraph examination process was completed (it was the same as Phase I, with the addition of an interpreter), the participants were asked to provide a writing sample to which the team applied the Flesch-Kincaid scale to determine the participants' reading levels. When the sample was completed, the participants were interviewed again by the deaf researcher to follow up on the experiences now that an interpreter had been provided. After the interview, participants were provided a stipend of $60 for their involvement in the study. They had to participate in both phases to receive the stipend. Prior to the beginning of the study, participants were advised that they would receive the stipend no matter the outcome of the polygraph examination.

## Results

The researchers had posited that the deaf participants would prefer the use of a certified legal interpreter during the polygraph examination. The interview responses supported this prediction. The participants expressed a strong appreciation for the provision of an interpreter over the other session where no interpreter was provided. While the polygraph examiner had the choice of pointing to the written materials, writing notes, and speaking for the most optimal communication possible, the comments from the deaf participants suggest that speechreading was their primary means of following and participating in the polygraph testing process. The participants' comments are clear about how the interpreter facilitated the polygraph examiner's communication with them. This is seen as a factor that can improve the participants' chances for successful completion of the exam. The results of how many participants completed the exam across Phase I and Phase II are dramatic. The number of completed exams was increased by 71% from Phase I to Phase II. The interviews from Phase I and Phase II were analyzed for common themes among the participants. The themes were identified based on their specific comments and the number of times a particular theme arose during the post-examination interview. Two of the three researchers independently examined the interview transcripts to identify themes. The common themes found were related to the polygraph process, their communication needs, and the

experience with having an interpreter.

**Phase 1**

During Phase I of this study with no interpreter being provided, only three out of the 14 participants (21%) were able to complete the full polygraph examination, including the pre-test interview, polygraph examination, and the post-test interview. The reason for this small number of participants making it the whole way through was that the examiner was not able to ethically continue, due to lack of understanding and being unable to communicate with the deaf participants. As such, 11 of the 14 participants' polygraphs were marked as incomplete. There were communication issues as seven of the participants stated they lacked the ability to read lips. The examiner noted that during the examination one male participant commented that only a small percentage of words made on the lips were speech-readable.

Of the three participants who were able to complete the polygraph examination in Phase I, one female participant had a No Opinion (NO) chart and the other two female participants had a No Significant Response (NSR) chart. As mentioned previously, only one participant scored the NO on the exam. The main reason why this individual received this score was due to a large spider that was seen on the floor. She was afraid of spiders and her feelings related to that affected the charts on the polygraph examination (see Roth, Bentley-Sassaman, & Lizor, 2017 for more information regarding this finding).

**Phase II**

In Phase II, with the use of a certified legal interpreter, 13 out of 14 (93%) of the polygraph examinations were able to be completed. Twelve out of 13 of the polyscores concurred with the examiner's findings. The one time it did not, the polyscore had an NO, while the examiner had an NSR. The one polygraph exam that was unable to be completed in both Phase I and Phase II was conducted with a particular male participant. The researchers and polygraph examiner posit that the communication breakdown was due to education level, reading ability, and lack of understanding of the words and phrases as noted by the examiner. This participant scored a 2.9 on the Flesch-Kincaid and used homemade signs along with ASL to communicate. The prevalence of semi-lingualism affected this participant's ability to complete the exam. Even with the use of an interpreter, the lack of comprehension did not allow the examiner to continue with the examination process.

The polygraph examiner disagreed with the polyscore's rating of an NO for one female participant. The polygraph examiner determined from the charts that the score should have been an NSR, but the machine rated it as an NO due to some movement during her exam, specifically during the last chart, which is why there was a discrepancy. This participant received an NO for both polygraph examinations due to too much movement during the tests. The remaining 12 polyscores concurred with the examiner's interpretation of the charts.

For two male participants, the polygraph charts were determined to be SR. These participants failed the polygraph based on the computer's algorithm, which concurred with the examiner's findings. In the post-test interview with the examiner, both participants admitted that they were not forthcoming with all the information.

Two female participants, on the other hand, showed an NO, meaning No Opinion, due to the fact that the first one became fidgety at the end of the exam, which skewed the reading. The

second one was nodding and moving her head, which then caused the equipment to label her exam as an NO. Another female participant was dozing off during both Phases I and II. For Phase I she scored an NSR, but in Phase II she scored an NO. In Phase II, the examiner noted that this individual was not being a willing participant.

**Polygraph Process**

When asked about the polygraph experience, a majority of participants, 11 out of 14, noted that it was "interesting." This may be because it was their first time doing this and for several of them, their only frame of reference was what they had seen on television. One male participant commented that he had "seen many different TV shows where they are polygraphing somebody and I thought that the polygraph examination was really not a big deal. However, I learned in real life it is more of a challenge." A female participant noted that comparing TV to really doing it, "it was different than what I had expected." Another female participant noted that it was interesting because of getting "hooked up to all the equipment." Also, another male participant noted that it was interesting because he had to be still and that "if I moved too much, that would mean that I was guilty." The third male participant commented that it was interesting, as in the real world if he was taking this without an interpreter, it would be really hard.

The participants discussed how they could not sit still throughout the polygraph exam. In Deaf culture, deaf people sign to communicate (which includes moving the hands and arms and at times, the shifting of the body itself), which is why during the exam several participants wanted to use signed language to answer instead of answering silently in their mind. Out of 14 participants, six mentioned that they would rather use signed language to answer the questions. The fourth male participant stated that, "I just had to relax, and remember not to sign yes or no and that's really hard because I am just so used to signing yes or no." Another, the first female participant," mentioned, "I think answering silently in your mind is something that is not equivalent to what hearing people can do because deaf people are so used to signing and moving." The third male participant stated:

> It felt like nothing, because I'm so used to signing that just sitting there not communicating, not doing anything, was really boring. It felt so silent to just sit there and I couldn't say any word or sign because if I did it would skew the polygraph results.

**Language and Communication Needs**

A large majority of participants in the study (12 out of 14) commented during Phase I that they needed an interpreter. Eleven out of 14 participants mentioned that it is very difficult to lip read, as they can only understand a few words here and there. The second female participant commented that she "really didn't understand anything at all" and would like an interpreter. The second male participant noted that he felt uncomfortable with trying to lip read and that "I need an interpreter." The third male participant mentioned that he does not read lips, so "they need to provide an interpreter; it is very important." The fourth female participant noted that there "was a major communication breakdown" and that "an interpreter is required." This was echoed in the fifth male participant's comments as well. The fifth female participant made an insightful comment that as the information from the polygraph could "be used against a person if they don't understand

the question and they respond," they should "definitely have an interpreter there."

The frustrations and stress of speechreading during normal daily activities are different than being under pressure taking the polygraph with probing personal questions. The third female participant noted that "I was so stressed out with not being sure if I was being understood, trying to lip read, all of this causes a lot of anxiety for me…obviously an interpreter is needed." The sixth female participant repeated several times that she needed an interpreter as she did not understand what was being said. The fourth male participant said that "English is not my first language," and because he uses ASL to communicate, "there must be a fully certified interpreter placed in the examination."

During the follow up interview after the second polygraph examination was completed in Phase II, 11 out of 14 of the participants specifically noted how much better the process went having a certified legal interpreter. The first male participant found out that with the interpreter present going back over the booklet, they had found that he misunderstood some of the questions initially. There was a question with two parts and he read the first part, but not the second, and therefore answered all but one question in that portion incorrectly. He thought if he answered *yes* for one item, it meant that all the items were to be answered as *yes*. He made a profound statement:

> If I answered the way I did, in real life, the deception would have found me guilty and I would have been put in jail, even though I would have been innocent. It would have been because I made that mistake on the paper.

This participant commented that people need to be very careful in how they read the questions. Having the interpreter there to interpret the questions being asked by the examiner during the pre-test interview, he was able to realize he had made an error in answering. This realization parallels what the third male participant had said earlier about not having an interpreter and possibly being sent to jail due to misunderstandings.

The participants noted the improved communication with the interpreter present. Many of them commented that it was "much better" or "a lot better" than the first time. The fifth female participant noted that "it was more effective because if I did not understand [the examiner] I would look at the interpreter and the interpreter would sign it to me to make sure I understood it correctly." The fourth male participant noted that having an interpreter present, "I understood everything much more easily and it saved our time as well."

Even though participants noted that Phase II was much better with an interpreter present, over half (eight out of 14) commented that they would have liked to have a Certified Deaf Interpreter (CDI) present.[2] The second female participant noted that she would feel more comfortable if the interpreter was "deaf, just like me." The fourth female participant said that the reason why she would prefer a CDI is that a CDI uses "native ASL to match the needs of the deaf person who is taking the exam." Although the third female participant said that she understood the hearing interpreter, she felt that for other deaf people, a CDI "would help them understand the message more clearly, for sure." In the case of the fifth male participant who could not complete the polygraph examination for either Phase I or II, he commented that a CDI "would help make it

[2] A CDI is a person who is deaf and has taken training to become an interpreter. A CDI is paired with a hearing interpreter who listens to the hearing speaker, signs the message to the CDI, then the CDI signs the message clearly in a way that can be best understood by the deaf person (using gestures, more visual approaches, idiosyncratic signs, native ASL). The deaf person then signs the response to the CDI, who then relays it to the hearing interpreter, who then speaks the message to the hearing person.

better." The first female participant said that a "Certified Deaf Interpreter could be added so they could be able to expand the message more, to be able to show the facial expressions and movements, to make it more comfortable." The fourth male participant noted that a CDI "would be more visual and would be able to show the concept and interpret the concept more visually and I could get a better understanding of what was asked."

One female participant commented that the hearing polygraph examiner needs to learn sign language. At face value, this might be taken to mean that she wanted him to learn her language. However, we interpret this to mean that the participant would prefer direct communication instead of going through an interpreter, which is understandable. The polygraph examiner would normally interact with examinees directly with a common language in use. Deaf individuals have a similar desire for this communicative set-up for the polygraph examination. Another female participant added that she prefers conversing in ASL. A third participant commented "if there was a deaf person who was already trained in providing polygraph examinations, because then we could have direct communication with the deaf person who would sign the questions." As the participants commented, they would prefer direct communication of a polygraph examiner who could communicate in ASL.

## Discussion and Conclusion

As a result of the research conducted and reported in this paper, it is evident that providing an ASL interpreter during a polygraph examination is effective. It is the status of ASL as a signed language and how it operates as deaf people's language which offers an explanation for why the interpreter made a positive impact on the polygraph testing process during the second phase. With the first phase (where the interpreter was not present), the faltering performance of many deaf participants can be attributed to their lack of access to spoken language. Speechreading is a poor or ineffective means for communication. The participants' comments indicate their strong need for communicating with ASL, which is understandable given that language constitutes a crucial element for any human communication. The findings related to semi-lingualism also point to the importance of ASL proficiency for deaf people's participation in the polygraph examination.

The fact that the study was limited to two regions in one state and a small sample size of 14 people in the study must be noted. The current study is best described as an initial exploration into the concept of linguistic accessibility that had not been adequately addressed in the research literature. While the deaf participants in the study were diverse in age, education, ASL proficiency, English literacy skills, and some ethnic diversity, there could have been a larger sample that included more a diverse population. More controls are also desirable for future studies. One example is investigating the polygraph testing performance of two groups of deaf participants that share a similar background, with one group using an interpreter and the other without the use of an interpreter. All participants would take the exam just once, and the variable of performance improvement due to taking the exam twice would be removed.

The new focus on linguistic accessibility can include a specific investigation on the impact of ASL proficiency among deaf polygraph test takers (e.g., by creating two groups with one not possessing native or native-like ASL proficiency while the other does). An investigation on the impact of a hearing interpreter vs. a deaf interpreter (or Certified Deaf Interpreter or CDI) is also worthwhile. Finally, it is important to investigate the impact of a deaf person or a person who is fluent in ASL who could conduct the polygraph examinations. This type of study would include consideration of the fact that the examinees would watch the polygraph examiner signing, which

may prove to be problematic (as it is best to avoid watching the examiner's face for the most valid results). Yet it is possible to produce a video where the examiner signs and then have it viewed by examinees. The examiner's face in this case would be 'locked' and deemed as safe. The various areas for investigation as outlined here should contribute to improving the communicative situation for deaf people.

The researchers who conducted the current study recommend the use of the Silent Answer Test with deaf people. While the participants in the study expressed how much they wanted to sign as part of responding to the questions from the polygraph examiner, they seem to have managed to remain silent. Deaf people may need special training during the pre-test session to prepare themselves for the 'unusual' experience of not moving their hands or arms while still being responsive to the questions. Recruitment of more deaf people participating in future studies will be needed to support this recommendation further.

Perhaps the most important implication of the current study is its identification of the best practice associated with polygraph testing with deaf people. If a polygraph examination is being given to deaf people, the research team is recommending an ASL interpreter (i.e., legally certified as discussed for the study) be utilized. In this sense, this study covering a sizable group of deaf participants provides evidence for the common and universal basic human needs for effective communication. The notion that a full natural language such as ASL must supersede 'communication options' represents a paradigm shift. Hopefully, the study's findings as discussed in this paper will produce a greater sensitivity among researchers for ASL and the concept of linguistic accessibility. Awareness of these factors can easily be translated into additional research work that provides direction in fulfilling deaf people's capabilities with the polygraph examination and in other communicative contexts.

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# Stuttering-Like Behaviors in American Sign Language

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## Abstract

The general understanding about stuttering is well-established, but its relationship to American Sign Language (ASL) is little understood. While some preliminary research evidence exists to support the notion that stuttering-like behaviors occur among deaf people who know and use ASL on a daily basis, it is best to describe this phenomenon as stuttering-like, based on the level of knowledge obtained to date. This study used a survey-based research design, which included a comprehension set of questions to ask a large number of professionals and non-professionals who associate with deaf children and adults about their perceived prevalence of signed language stuttering. This study represents a new step for investigating stuttering-like behaviors in the signed language modality. A 19-item survey was developed and divided into two sections: 1) respondents' demographic information and ASL knowledge and experience; and 2) questions regarding stuttering-like behaviors. A majority of the respondents reported that they have observed deaf individuals who 'stutter' while signing. These respondents were able to identify with specific atypical behaviors as reported in the literature for the signed language modality. Some of the universal stuttering-like behaviors such as the location of atypical behaviors occurring in the beginning and the middle of an utterance are included in the findings. The respondents also confirmed other behaviors and the impact of communicative settings for deaf signers that are associated with hearing speakers who stutter.

## Introduction

The topic of signed language stuttering is significant since there are many deaf people who live in the United States and rely on American Sign Language (ASL) as their means for communication. The estimated number of deaf signers range between 500,000 to one million strong (Mitchell, Young, Bachleda, & Karchmer, 2006; Padden, 1987; Schein & Delk, 1974). ASL is a signed language and is understandably deaf people's language of choice. Unlike English or any spoken language, ASL is visual and fully accessible for acquisition and use (see Supalla & Cripps, 2008 for the significance of linguistic accessibility). However, researchers in the field of speech-language pathology focus on spoken language when it comes to studying and understanding stuttering (see Bloodstein & Bernstein Ratner, 2008). It is generally reported that the prevalence of stuttering among English language speakers is approximately 1% in the United States whereas the incidence is approximately 5% (Bloodstein & Bernstein Ratner, 2008). Speech-language pathologists frequently work with these individuals and have access to a wealth of information related to the assessment and treatment of stuttering.

The level of awareness of deaf people's stuttering-like behaviors while signing is poor (Cripps, Cooper, Evitts, & Blackburn, 2016a) and there is no known therapeutic practice for stuttering-like behaviors in the signed language modality (Cripps, Cooper, Supalla, & Evitts, 2016b). Within this background, it may be necessary to adopt the term of stuttering-like for ASL users when studying this phenomenon among deaf people. It is also important for researchers and

clinicians to understand the historical background associated with the use of ASL. In the eyes of society, deaf people's language was once widely thought to be atypical and consequently marginalized for most of the two centuries of existence. For example, the field of deaf education reflected the social values with debate raging over whether deaf students should sign in the classroom or not (Van Cleve & Crouch, 1989).

The outlook for ASL started to improve in the 1970s and 1980s in light of the civil rights movement. From that time to present, many linguists have become involved in studying and validating ASL as a full-fledged human language (see Meier, 2002 for the history of signed language research). The present level of understanding ASL is strong, including recognition for its possession of linguistic features, such as phonology, morphology, syntax, semantics, and pragmatics (Klima & Bellugi, 1979; Sandler & Lillo-Martin, 2006; Stokoe, 1960; Valli, Lucas, Mulrooney, & Villanueva, 2011; Wilbur, 1979). Researchers should perhaps now shift to understanding the nature of stuttering-like behaviors in the signed language modality.

Snyder (2009) addressed the theoretical question of stuttering and how it may occur as a result of cognitive processing and production errors, regardless of the type of language modality used, such as speaking or signing. Put another way, perhaps Snyder is questioning if stuttering occurs only in the spoken mode, but previous literature and case studies appear to reflect that there are stuttering-like behaviors exhibited by individuals who use signed language. Thus, he concluded that stuttering might be based on overall cognitive processing rather than the modality used to communicate. This counters (or adds to) the popular belief by language professionals (and society at large) that stuttering occurs only in speech and through spoken language. Therefore, further study of signed stuttering is much needed. A small number of scholarly publications have reported that stuttering-like behaviors may occur in ASL and other signed languages must not be overlooked.

## Previous Research of Stuttering-like Behaviors in Sign Languages

The earliest studies assessing stuttering-like behaviors among deaf individuals were conducted using surveys, which date back to the late 1930s (Backus, 1938; Harms & Malone 1937). However, these findings were based on the use of spoken English. It is plausible that some deaf individuals may develop some skills while speaking as a result of what is known as oralism, which was used for deaf education at the time when these studies were published. For deaf individuals, especially those who are profoundly deaf since birth, learning how to speak is a very difficult task. The impact of hearing loss is immense, which includes deaf individuals who do not have control over linguistic input. However, researchers during the 1930s managed to generate findings about the existence of stuttering for orally trained deaf individuals.

It is interesting to note that the first study to assess stuttering-like behaviors in ASL coincides with how signed language was noted to possess linguistic properties (i.e., Silverman & Silverman, 1971). The findings for 'signed stuttering', at that time, have been cited and discussed routinely. Cosyns, Van Herreweghe, Christiaens, and Van Borsel (2009), Snyder (2009), and Whitebread (2004) are recent researchers who examined the phenomenon of 'signed stuttering'. The scope of this research now expands to include Flemish Sign Language (of Belgium) and a list of characteristics related to stuttering-like behaviors in the signed language modality has been formed and reported.

For example, Whitebread (2004) reported a list of eight characteristics (and descriptions):

1) *Repetition of sign movement* – this symptom involves the unanticipated use of repetition for movement when a given sign requires only singular movement. For example, the production of GRANDMA requires a spiral movement (with one circle after the other over the path) away from a signer's chin. Instead, the signer would produce the visibly distorted word all on the chin location with repeated circular movement made there;

2) *Blocking during sign movement* – this symptom is actually broad and underlies one of the important characteristics of stuttering-like behaviors, which is inconsistency. If a sign is subject to blocking during its movement, it would appear to be frozen or halted. Therefore, the sign ends up stalled during its production. This occurs randomly with various signs. There would be no sign that is always affected;

3) *Jerky and hesitant sign movement* – this behavior occurs prior to or during signing. All phonological features of the sign associated with the handshape, location, and movement would be accurate with the exception of the involuntary pause. With START as an example, this sign may have two hands in their proper locations, but the signer would demonstrate jerky or hesitant movement at the initiation of twisting movement to one hand. A similar effect on signing occurs between the time the sign is completely formed and the time the movement necessary to complete the sign begins;

4) *Exaggerated/prolonged signs* – with this symptom, a signer may find it necessary to extend time to complete a word appropriately. A word, or possibly a whole phrase would be signed very slowly in this case. The signer may also do a word with a significantly larger movement. An example of this would be signing HOUSE with completely outstretched arms. The sign becomes distortedly magnified;

5) *Involuntary interjections* – gestures would be included in signing that is not something to expect for signers. For example, a signer may wind up his arm prior to signing THROW. This winding up would be adding additional time needed to overcome the initiation problem. The involuntary interjection of gestures becomes a visual distortion to signing;

6) *Unusual and extra body movements* – this possible symptom includes a distorting movement while a signer expresses PARENTS, for example. The elbow raising upward in a dramatic way during this sign production is not how the sign is normally produced. The elbow needs to stay low;

7) *Poor fluidity of the sign* – with this possible symptom, a signer produces words that are choppy and unnaturally gated or timed. One example would be DOG that normally stays in one place when undergoing production. The handshape positioned in the signing space changes repeatedly from within with the thumb and

> fingers. The demonstration of lacking fluidity becomes evident when the signer produces the internal movement to the hand just once and pans the whole hand across the space simultaneously;
>
> 8) *Increased muscular tension associated with signing* – a signer experiencing this possible symptom would not be at ease when signing. With the phrase TRAIN ZOOM-AWAY as an example, the signer would be visibly tense with the first sign (by holding up the movement) and then make a strong release in movement with the second sign.

Given the above, it is important to know whether the various characteristics of 'signed stuttering' have actually occurred among deaf individuals. Silverman and Silverman (1971) concluded that half of the teachers of the deaf they surveyed reported seeing students exhibiting stuttering-like behaviors while signing. However, their study was limited because the responders were not informed about the characteristics of stuttering-like behaviors (e.g., repetition, hesitation, blocked, etc.). Cosyns et al. (2009) surveyed individuals who interacted with Flemish Sign Language users and provided the participants with the characteristics of stuttering-like behaviors in signed language. Whitebread (2014) cautioned that the sample size (i.e. 13 responders) for this study is too small to draw noteworthy conclusions. Montgomery and Fitch (1988) used a sample size of 77 responders who work in schools for the deaf, but only 12 deaf students were reported to be stutterers.

Another weakness in the survey research literature on 'signed stuttering' relates to the assessment of secondary behaviors, such as facial grimacing, signs of frustration, etc. For example, Cosyns and her collaborators (2009) failed to specify which secondary behaviors accompanied the identified stuttering-like behaviors in signed language. They only noted whether or not an individual exhibited secondary behaviors (without any additional information). Therefore, the evidence regarding secondary behaviors and their relationship with stuttering-like behaviors in signed language remains unclear.

It is important to note that Cosyns and her collaborators went beyond Whitebread's (2004) list of 'signed stuttering' characteristics to include other features of stuttering. For example, they noted the different locations of 'signed stuttering' such as at the beginning, middle, and/or at the end of a sign movement. While the number of responders for their study is small, the preliminary finding that stuttering-like behaviors in signed language varied in locations is interesting and warrants further study. With spoken language studies, it has been found that stuttering behaviors were most frequently found in beginning and middle of the utterance (e.g., Au-Yeung, Howell, & Pilgrim, 1998; Wingate 1979).

Future studies of 'signed language stuttering' also need to consider external factors, which may account for deaf individuals who experience cognitive interferences to their signing that lead to atypical behaviors as outlined in the Whitebread list, but may not be considered 'signed stuttering'. According to the research literature for spoken language, the impact of communicative settings on an individual ranging from being in front of a large group of people to one-to-one conversations can cause increased stuttering behaviors (e.g., Guitar, 2014; Yaruss & Quesal, 2004). Therefore, the study of external factors that may increase the number of stuttering-like behaviors exhibited by deaf individuals while signing also warrants further study.

Finally, all survey studies conducted to date that assessed 'signed stuttering' did not consider or describe the respondents' own signing skills. That is, the description of previous respondents is only noted "to know" ASL or Flemish Sign Language. Therefore, future studies should more thoroughly describe respondents' signed language proficiency. In summary and given the above, the purpose of the current investigation was to further study 'signed stuttering' and aims to move beyond the exploratory stage of inquiry by studying a larger number of participants who will respond to a survey which includes a longer, more exhaustive series of questions.

## Method

### Participants

Participants were identified from an internet search of deaf-related associations (e.g., state-wide deaf associations and national deaf association such as National Association of the Deaf), institutions (e.g., state-wide schools for the deaf and universities with deaf/signed language-related programs), and organizations (e.g., professionally related organizations or agencies serving the deaf). A total of 422 individuals received the survey with a cover letter via email and 152 completed the survey (36% which is considered as highly successful rate for online respondents according to SurveyMonkey website - *https://www.surveymonkey.com/mp/ sample-size/*). Participants were required to be above the age of eighteen, have knowledge of ASL, and have communicated with ASL users. All of the participants were notified that the university's Institutional Review Board had approved this study.

### Survey Design and Its Validity

A 19-item survey was developed and pilot-tested with 10 students and faculty from a speech and language pathology department at a mid-Atlantic university to assess overall validity and to ensure that the survey is operational. The final survey was created after receiving the feedback from the pilot-testing participants. The final version was divided into two parts: 1) demographic information along with ASL knowledge and experience; and 2) questions regarding stuttering-like behaviors (see appendix for the survey questions).

In the first part of the survey, participants were asked about their ASL proficiency level (self-evaluation), years of ASL use, and their interactions with individuals who exhibited stuttering-like behaviors in the signed language modality. The respondents who reported that they have encountered deaf individuals who exhibit stuttering-like behaviors continued to the second part of the survey. Participants then responded to the second set of questions about deaf individuals who exhibit signed stuttering-like behaviors based on the information from the Whitebread list.

The respondents were also asked about the secondary behaviors that are frequently exhibited with stuttering-like behaviors (such as grimacing and frustration) and whether the perceived stuttering-like behaviors exhibited by the ASL users were exacerbated by certain types of discourse situations (e.g. taking to a small group of people, public presentations, etc.).

### Questionnaire Administration Procedures and Data Analysis

Methodological procedures involved the administration of a questionnaire that was designed to assess the prevalence of stuttering-like behaviors among deaf individuals who use ASL to communicate. Participants were instructed to complete the questionnaire in one sitting, and it took them approximately ten minutes to complete. The questionnaire was administered and completed through Campus Labs, a widely-used survey administration website.

## Results

### Demographics and ASL Experience

Demographic information of the participants who responded to the survey are summarized in Table 1. The total number of respondents was 152, and they resided in 9 states: California, Florida, Kentucky, Louisiana, Pennsylvania, Maine, Maryland, Texas, and Washington, D.C.

Table 1: Demographics and ASL Experience of Respondents:

| | |
|---|---|
| *Gender:* | |
| Female | 114 (75%) |
| Male | 38 (25%) |
| | |
| *Age:* | |
| 19-30 | 31 (20%) |
| 31-40 | 32 (21%) |
| 41-50 | 36 (24%) |
| 51-60 | 34 (22%) |
| 61-70 | 17 (11%) |
| Did not respond | 2 (2%) |
| | |
| *Education:* | |
| High School Diploma | 13 (8.5%) |
| GED | 1 (1%) |
| Associates Degree | 10 (6.5%) |
| Bachelor's Degree | 26 (17%) |
| Master's Degree | 81 (53%) |
| Doctoral Degree | 20 (13%) |
| N/A | 1 (1%) |
| | |
| *Proficiency in ASL:* | |
| Yes | 129 (85%) |
| No | 22 (14%) |
| Did not respond | 1 (1%) |

| | |
|---|---|
| *Years using ASL:* | |
| Less 5 years | 21 (14%) |
| 6-10 years | 11 (7%) |
| 11-20 years | 24 (16%) |
| More than 20 years | 81 (53%) |
| Did not respond | 15 (10%) |
| | |
| *Interaction with ASL Stuttering:* | |
| Yes | 90 (59%) |
| No | 29 (19%) |
| Not sure | 18 (12%) |
| Did not respond | 15 (10%) |

With regards to educational background, roughly one half of the respondents had Master's degrees (81 respondents, 51%) and the majority worked at in a school-based environment (which requires a Master's degree for employment). Most of the respondents were proficient in ASL (129 as compared to 22 respondents with lack of proficiency in ASL); however, when the respondents rated their proficiency level in ASL, 119 of them responded that they were native (49 respondents, 32%), near-native (48 respondents, 32%), or conversational (22 respondents, 14%) signers. All participants indicated that they could sign (and only a small percentage indicated weak signing skills). Moreover, 22 respondents reported signing at the conversational level, which suggests that they have completed two years of ASL study (or more). The majority of participants reported using ASL for more than 11 years (105 respondents, 69%) whereas 21 (14%) participants reported having less than 5 years of experience using ASL.

At the end of the first part of the survey, the respondents were asked to think of deaf individuals who exhibited stuttering-like behaviors using the signed language modality. Ninety participants (59%) reported that they had experience interacting with deaf individuals who exhibited stuttering-like behaviors in ASL, while the remaining 62 respondents (41%) reported that they did not have any experience.

**Observations of Stuttering-like Behaviors in ASL**

The 90 respondents who affirmed their observations of 'signed stuttering' proceeded with the second part of the questionnaire, which asked about the eight characteristics (of 'signed stuttering' from Whitebread list) and other related questions. Five respondents failed to complete this part of the survey, which left a total sample size of 85. Results regarding stuttering-like behaviors when signing and individuals' backgrounds are shown in Table 2. Of the 85 deaf individuals who exhibited stuttering-like behaviors, 75 % were males and 25 % were females. The overall pattern of results indicated that the respondents identified their observational experiences with all eight characteristics from the Whitehead list, while three characteristics were marked most frequently: 1) Hesitation of sign movement (20%); 2) Repetition of sign movement (17%); and Poor fluidity of the sign (16%). A small number of the respondents (i.e., 9%) reported that they were not sure how to label the stuttering-like behaviors they witnessed in ASL.

Table 2: Individuals with Signed Stuttering:

| | |
|---|---|
| *Gender:* | |
| Female | 21 (25%) |
| Male | 64 (75%) |
| | |
| *Age:* | |
| 0-5 | 6 (7%) |
| 6-10 | 11 (13%) |
| 11-20 | 23 (27%) |
| 21-30 | 11 (13%) |
| 31-50 | 20 (23.5%) |
| 51+ | 9 (10.5%) |
| Did not respond | 5 (6%) |
| | |
| *Types of ASL stuttering (263 responses based on 85 respondents):* | |
| Repetition of sign movement | 45 (17%) |
| Blocking during sign movement | 16 (6%) |
| Hesitation of sign movement | 52 (20%) |
| Exaggerated/prolonged signs | 27 (10%) |
| Involuntary interjections | 15 (6%) |
| Unusual body movements | 23 (9%) |
| Poor fluidity of the sign | 42 (16%) |
| Increased muscular tension (signing) | 19 (7%) |
| Other | 4 (2%) |
| Not sure | 9 (3%) |
| | |
| *Where signed stuttering occurred in the utterance (115 responses based on 85 respondents):* | |
| Beginning | 46 (40%) |
| Middle | 37 (32%) |
| End | 15 (13%) |
| Not sure | 17 (15%) |
| | |
| *Demonstration of any secondary behaviors (i.e., distracting sounds, facial grimacing, head movements, movements of the extremities):* | |
| Yes | 42 (49.5%) |
| No | 18 (21%) |
| Not sure | 25 (29.5%) |
| | |
| *Type of secondary behaviors (74 responses based on 42 respondents):* | |
| Distracting sounds | 9 (12%) |
| Facial grimacing | 23 (31%) |
| Head movements | 22 (30%) |
| Movements of the extremities | 17 (23%) |

| | |
|---|---|
| Other | 2 (3%) |
| Not sure | 1 (1%) |
| | |
| *Specific situations that seem to worsen ASL stuttering behaviors:* | |
| Yes | 42 (49%) |
| No | 43 (51%) |
| | |
| *Kinds of situations (67 responses based on 42 respondents):* | |
| Signing in front of a small group | 16 (24%) |
| Signing in a front of a large group | 22 (33%) |
| Giving presentations | 9 (13%) |
| Other | 20 (30%) |

With regards to whether stuttering-like behaviors occurred in a signed utterance from a deaf individual (in the beginning vs. in the middle vs. at the end), a total of 115 responses were made. The majority of the respondents reported that it occurred at the beginning of an utterance (i.e., 46 responses; 40%) and in the middle (37 responses; 32%). Therefore, stuttering-like behaviors most likely occurred at the beginning or in the middle of a signed utterance. Stuttering-like behaviors did occur at the end of a signed utterance, but it appeared to be rare according to the respondents. A small number of respondents were unsure about where stuttering-like behaviors occur in a signed utterance (17 out of 85 respondents; 15%).

One half of the respondents (42 or 49.5%) reported the prevalence of secondary behaviors among the individuals who demonstrate stuttering-like behaviors when signing. Facial grimacing (e.g., jaw jerking, tongue protruding, lip pressing, or jaw muscles tensing) was most reported (23 responses, 31%), followed by head movements (e.g., back, forward, turning away, poor eye contact, or constant looking around) (22 responses, 30%). Movements of the extremities (e.g., arm and hand movement, hands about face, torso movement, leg movements, foot-tapping, or swinging) was the third type most common identified (17 responses, 23%) and distracting sounds (e.g., noisy breathing, whistling, sniffing, blowing, or clicking sounds) was the fourth type with 9 responses (12%).

Based on 67 responses from 42 respondents, scenarios that worsened stuttering-like behaviors among deaf individuals were signing in front of large groups (22 responses, 33%), signing in front of small groups (16 responses, 24%), and giving presentations (9 responses, 13%). However, most of the respondents (20 responses, 30%) identified 'other' situations where the stuttering-like behavior became worse. Most of the scenarios were based on expressing emotions (angry, frustrated, or stressed) which is considered as internal factor related to stuttering (e.g., Guitar, 2014; Yaruss & Quesal, 2004). Other situations reported included: one on one interactions, meeting new people, peer competition for talk time, and signing in front of a webcam.

## Discussion and Conclusion

Results from the current survey-based study provide relevant information regarding individuals who exhibit stuttering-like behaviors in ASL. Findings appear to corroborate the evidence from previous studies that supported the existence of stuttering-like behaviors in signed language. Based on the observations from the respondents in the study, 85 deaf individuals

exhibited 'signed stuttering'. Compared to previous studies, current results indicated more individuals who exhibit this type of stuttering in ASL. The individuals who exhibited stuttering-like behaviors appear to support Snyder's (2009) theory of stuttering as part of a central processing error regardless of modality (i.e., speech or sign). The fact that many respondents could identify with the eight characteristics of 'signed stuttering' in the Whitebread list is noteworthy. This finding is consistent with other studies assessing stuttering-like behaviors in the signed language modality indicates a degree of validity for using the Whitebread list.

Of the deaf individuals who demonstrated stuttering-like behaviors, 75% of the males exhibited this type of stuttering which is similar to the findings in spoken stuttering (3:1 male to female ratio) related to gender differences (Guitar, 2014). In addition, stuttering-like behaviors while signing were most frequently observed at the beginning and middle of the utterance, which appears to be consistent with the findings from spoken stuttering studies (e.g., Au-Yeung, Howell, & Pilgrim, 1998; Wingate 1979). Other notable findings of the current study include the role of environmental settings during which signed stuttering-like behaviors in ASL frequently occurred. The notion of how specific situations could worsen stuttering-like behaviors for ASL is consistent with what hearing individuals who stuttering experience. Information that was surprising, which had been shared from the respondents from answers to open-ended questions, was the influence of "internal factors" for individuals with 'signed stuttering'. For example, negative emotions (such as stress, frustration, and anger) were also found to influence stuttering-like behaviors in ASL. External and internal factors identified in this study were similar to factors that influence spoken language stuttering (e.g., Guitar, 2014; Yaruss & Quesal, 2004).

Another item of interest relates to awareness and self-awareness of 'signed stuttering'. Most respondents were unsure whether the individuals who exhibited these behaviors were aware of their stuttering-like behaviors (only 28% of the respondents reported that this was the case). This suggests that a large number of individuals with 'signed stuttering' in the deaf community may not be knowledgeable or aware of the characteristics of stuttering-like behaviors in ASL. This lack of awareness emphasizes the need for education of deaf community members and their families related to stuttering and perhaps overall language abilities in ASL. Granted, there are some speech-language pathologists who know ASL and may work in a school for the deaf. However, the specific education and training that they have is strictly tied to spoken language (Shipley & Cripps, 2018; see Cripps et al., 2016a for details on the lack of familiarity with professionals on signed language disorders such as graduate students who are trained to become speech-language pathologists).

Future research could focus on more in-depth case studies that continue to identify the three most commonly types of signed stuttering (i.e., hesitation of sign movement, repetition of sign movement, and poor fluidity), which may serve as a starting point for language-related professionals. These three types of behaviors could be identified as targets for diagnostic assessments and therapeutic procedures (and treatment models) for this specific population who exhibit signed stuttering. Such focus of study will contribute to a greater understanding of stuttering-like behaviors and their characteristics in signed language. Overall, the current study sheds a strong light on the existence of stuttering-like behaviors in signed language, findings that corroborate previous research. The results from current study found a large number of individuals who demonstrated stuttering-like behaviors in ASL, suggesting that increased attention should be paid to the area of signed language pathology, such as developing diagnostic and therapeutic procedures to help this population. As human beings, deaf individuals who exhibit these types of

stuttering-like behaviors, as well as their hearing counterparts, deserve to obtain language services to improve their quality of life.

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## Appendix: Survey Questions

1. What is your gender?
    - Female
    - Male

2. What is your age? (Please answer using a whole number only)

3. What is your state of residence?

4. What is your level of education?
    - High School Diploma
    - GED
    - Associates Degree
    - Bachelor's Degree
    - Master's Degree
    - Doctoral Degree
    - Medical Degree
    - N/A

5. What is your occupation?

6. Are you proficient using ASL?
    - Yes
    - No

7. How would you rate your ASL proficiency level?
    - Basic understanding
    - Conversational
    - Near-native

- Native
- Other (please specify)

8. How many years have you been signing with ASL users? (Please answer using a whole number only)

9. Have you ever signed with an ASL user who demonstrates any of the aforementioned signed stuttering behaviors?
    - Yes
    - No
    - Not sure

10. Identify the ASL user with whom you have signed who demonstrates signed stuttering behaviors by providing his or her first, middle, and last initials:

11. What gender is this individual?
    - Female
    - Male

12. What age is this individual? (Please answer using a whole number only)

13. Which types of signed stuttering behaviors have you noticed during this individual's ASL production? (Check all that apply)
    - Repetition of sign movement
    - Blocking during sign movement
    - Hesitation of sign movement
    - Exaggerated/prolonged signs
    - Involuntary interjections
    - Unusual body movements
    - Poor fluidity of the sign
    - Increased muscular tension (signing)
    - Other (Please specify)
    - Not sure

14. In general, where are these signed stuttering behaviors located in the signed utterance? (Check all that apply)
    - Beginning of a signed utterance
    - Middle of a signed utterance
    - End of a signed utterance
    - Not sure

15. Is this individual aware of her/his signed stuttering behaviors?
    - Yes
    - No

- Not sure

16. Does this individual demonstrate any secondary behaviors (i.e., distracting sounds, facial grimacing, head movements, movements of the extremities)?
    - Yes
    - No
    - Not sure

17. Which secondary behaviors have you noticed?
    - Distracting sounds (noisy breathing, whistling, sniffing, blowing, clicking sounds)
    - Facial grimacing (jaw jerking, tongue protruding, lip pressing, and jaw muscles tense)
    - Head movements (back, forward, turning away, poor eye contact, constant looking around)
    - Movements of the extremities (arm and hand movement, hands about face, torso movement, leg movements, foot-tapping, or swinging)
    - Not sure
    - Other (please specify)

18. Are there situations that seem to worsen the signed stuttering behaviors (i.e., they become more frequent)?
    - Yes
    - No

19. What are the situations that worsen signed stuttering behaviors?
    - Signing in front of a small group
    - Signing in front of a large group
    - Giving presentations
    - Other (Please specify)

# Reading, Special Education, and Deaf Children

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## Abstract

Traditional deaf education practices for teaching reading to deaf children are subject to evaluation in regards to validity of decoding and linguistic comprehension. Special education has its own premise for how reading should be taught to children with disabilities. This includes 'supports' with its emphasis on accessing information and activities, which are targeted for their effectiveness. Two support approaches for deaf children differ based on the use of English and American Sign Language (ASL). Deficiencies of the English and ASL support approaches become apparent when compared to the innovative reading instruction approach known as ASL gloss. ASL gloss falls in line with the Universal Design for Learning (UDL) conceptualization. Unlike special education, UDL emphasizes access to learning. ASL gloss allows deaf children to experience decoding and linguistic comprehension in an authentic manner. The text matching with what deaf children know in ASL contributes to such outcome. Signed language reading is proposed as an important feature for the education of deaf children. A short description on ASL gloss as a methodology provides a rationale for successful signed language reading. Discussion includes how ASL gloss is also designed to facilitate deaf children's transition to written English as their second language.

## Introduction

To begin, reading is inherently tied to language. And for deaf children who sign, this is crucial to remember. American Sign Language (ASL) is frequently what deaf children know and use. Having these children learning to read in ASL is a novel and interesting proposition in its own right. The fact that deaf children do not hear English indicates that the concept of signed language reading becomes even more important. Special education has its own premise for how reading should be taught for children with disabilities. Whatever practices that special education pursues with deaf children warrants a close look for evaluation purposes. However, signed language reading is not something that is pursued in the field of deaf education. ASL is confined to use 'through the air'. For over two centuries of deaf education in the United States that began in 1817, up to its affiliation with special education since the 1970s, reading has been tied to English. With the cross-disability design of special education, hearing impairments and/or deafness constitutes one of 13 categories that include autism, developmental delay, emotional disturbance, mental retardation, multiple disabilities, visual impairments, etc. (Gargiulo, 2009).

Of special relevance is how Universal Design for Learning (UDL) offers a route for exploration on how deaf children can be best taught reading. The historical manner in which children with disabilities have been taught, calls for reform through the creation of an UDL curriculum. Hitchcock, Meyer, Rose, and Jackson (2002) expressed their concern over traditional practices of special education as follows:

> There is a tendency to equate access in a curriculum with access to information, or access to activities. But a curriculum is not information or activities, it is a plan for learning, and therefore the learning has to be accessible. (pp. 14-15)

Rose (2000) explained that 'access to information' must be differentiated from 'access to learning' as the former requires "the greatest amount of support possible at all times" (p. 68). The latter is a characteristic of UDL and addresses how a child must have "access to the learning itself, and that they experience changes in their knowledge and skills and grow in their capacity to learn more" (p. 68). What this suggests is that educators must be careful, given that all children need to be ensured the opportunity to learn. Even though information may be available, it may remain inaccessible and therefore not learnable.

There is an additional argument that Rose (2000) made for UDL in that printed books present "information in one manner for everyone, yet students' varied learning needs and styles call for alternative formats" (p. 67). What this suggests is that the English text can be a source of reading problems. Text manipulation has been proposed as a way of making the text more accessible leading to improved reading performances (Ralabate, 2011). Imagine an English text that is altered to the point that it resembles the morpho-syntactic structure of ASL. Deaf children should find this type of text more readable.

In fact, a charter school in Arizona pursued this kind of text manipulation under the name of ASL gloss. Specifically, ASL gloss encompasses a few components to help ensure that deaf children experience a transition from ASL to English literacy during the early elementary school years. The first publication made on this topic (S. Supalla, Wix, & McKee, 2001) was published outside the field of deaf education. Only recently, the long-standing journal for deaf education, American Annals of the Deaf (Volume 161, Number 5, Winter 2017) published a special issue that explored the concept of how deaf children may benefit from reading in ASL. ASL gloss is included in this issue (S. Supalla, Cripps, & Byrne, 2017), but the focus of that article was to defend the integrity of the text manipulation concept.

The next step to undertake is to become proactive and examine what special education has to offer in teaching English literacy to deaf children. This article offers a unique opportunity to compare ASL gloss with what has been attempted with teaching English literacy to deaf children. Any limitation to the special education practices will provide insights on how to initiate reform to improve deaf children's potential for becoming fluent readers. English literacy for deaf children should not be defined by poorly conceived classroom practices.

## ASL Gloss as a Reading Instruction Model

For this section, a review of key concepts and examples from S. Supalla's *A Sketch on Reading Methodology for Deaf Children* (2017) will lay the foundational premises for ASL gloss (readers who are interested in a research review supporting signed language reading are encouraged to read that paper directly). The Arizona charter school is the only known site in the United States that had embraced ASL gloss and followed the Universal Design for Learning to provide alternative formats in teaching reading to children with disabilities. Educators at the charter school understood the importance of deaf students having access to the learning itself and must "experience changes in their knowledge and skills and grow in their capacity to learn more" in Rose's own words as mentioned at the beginning of this paper. It can be said that an UDL curriculum was developed and used at the charter school.

It is necessary to look closely at how the manipulated text, or glossed text, is created. The English text is subject to what is known as interlinear translation in a glossed version, sentence by sentence, with the words rearranged according to ASL's morpho-syntactic structure. A set of gloss conventions are available to help ensure that the text represents ASL as accurately as possible. Close to 300 literature and basal readers for children have led to the creation of an ASL gloss library (see the Gloss Institute at http://www.glossinstitute.org/inventory-of-gloss-books.html for the collection of glossed books for use with deaf children).

It is important to keep in mind that glossed books make up only one component of ASL gloss. There are other components that warrant later investigation. The demonstration of a selected English sentence and its glossed version is as follows:

Original English sentence: The dog is chasing the rabbit.

Glossed version: DOG NOW CHASE>IX=3 RABBIT.

A deaf child can experience linguistic comprehension when reading given that the glossed text matches with the ASL the child knows. The glossed English words are all capitalized to represent the four ASL signs, which is the total number of ASL signs in the sentence (with six being the total number for the original English sentence). Full capitalization with the words is an important cue for deaf children to know that the text they read is ASL, not English. Structurally, no definite article is used in the ASL sentence, which is correct for the signed language. The glossed sentence also has the insertion of NOW as a separate word (or "time sign") before the verb to indicate a semantic equivalence of the present progressive tense in English. Note that the verb CHASE undergoes a third-person object agreement inflection. This involves the verb redirected in its movement to agree with the location of the rabbit in the signing space (with the attachment of the gloss convention >IX=3 to the verb representing inflection of the sentence). Finally, the underline under DOG represents the topicalization shown visually in ASL through the use of the signer's raised eyebrows indicating that the dog is the topic of the sentence.

Related to cognition, the glossed sentence example represents what deaf children think inside their heads. For the general phenomenon or event of how a dog is chasing a rabbit, deaf children will read the glossed sentence based on the correct number of words (i.e., four, not six). This includes reading inflectional markers and facial markers, which contribute to the well-formedness and expressive power of ASL. Critically, deaf children are able to read 'aloud' the glossed text (by reading and signing at the same time). Their oral reading performance can be successfully assessed through the running record (or miscue analysis), a well-known reading development measure commonly used among hearing children (Cripps, 2008).

Additionally, deaf children at the Arizona charter school had the capacity to decipher new and unfamiliar English words when reading a glossed text. The second component of ASL gloss, The Resource Book (RB) acts as an English-ASL dictionary. Ideally, glossed books are all read through the use of apps. Such apps allow deaf children to read on their iPad and click English words and find their meaning by reading the sign equivalents via the RB. Thousands of English words paired with written signs are included in the RB. With the glossed sentence example discussed earlier, deaf children can look up the RB for any of the words. The RB format looks like this:

CHASE……...∩ ∩ ☋ ☙ ᴎ
DOG…….....𝀪 ≈ ᴎ ∋

NOW……...ϟ ϟ ϶ ⚡ ⚡
RABBIT…….. ‖ ‖ ≈ ᴎ ϶

The written signs listed above are made possible through the creation of the ASL-phabet at the Arizona charter school. This system has a total of 32 graphemes accounting for the three phonological parameters of signs: Handshape, Location, and Movement. The ASL-phabet graphemes function similar to letters in spoken language alphabets. The ASL-phabet was designed for writing words in ASL only. Deaf children are required to read the glossed text for sentences, which leads to their exposure to English vocabulary all while reading in ASL. The significance of the glossed text being a hybrid of English and ASL must not be overlooked. For the most part, spelling and orthography between the glossed and English texts are the same. Deaf children find regular books more readable when they read glossed books on a regular basis. For example, after reading the glossed sentence example and knowing the meaning of CHASE, DOG, NOW, and RABBIT (via the RB), deaf children will be able to read the same words in any regular text. Deaf children at the charter school were taught word decoding skills in the signed language and proceeded with reading the ASL equivalents to the English words successfully.

To complete the transition from ASL to written English, deaf children at the Arizona charter school engaged in the third and last component of ASL gloss: Comparative Analysis of the texts. The children learned English structures through the comparison of glossed and conventional English texts. The teacher explicitly taught those English structures that differ from what the children knew in ASL. The earlier sentence examples of English and glossed text (i.e., The dog is chasing the rabbit. vs. DOG NOW CHASE>IX=3 RABBIT.) would be a sample lesson in comparative analysis. Over time, the glossed and English sentence materials present grade-level information from less to more complex comparisons. These comparisons create a time-based distribution of English structures to be learned that were comparable to ASL, along with those that were independent of ASL structures.

By the fourth grade, ASL gloss ceased, which was confirmed through assessment. Deaf children moved from the stage of learning to read to that of reading to learn. This outcome was tied to the carefully executed integration of the three components of ASL gloss: Glossed books, RB, and Comparative Analysis. The process of learning to read for deaf children is unique as it involves the use of one language to decode another language. ASL gloss allowed these children to use their signed language knowledge for the purpose of transitioning to written English as their second language.

## A Critical Review of Traditional Approaches for Teaching English Literacy to Deaf Children

Within the context of special education, ASL gloss is seen as unnecessary. However, educational supports are expected to ensure that deaf children will achieve reading skills (regardless of the limitations associated with the English text). It is important to note that some educators who work with deaf children believe that Bilingual/Bicultural Education (BiBi) stands alone and is not part of the special education framework. Yet the BiBi approach has ties to special education and thus termed as an ASL support for this paper. On the opposite end of the spectrum, the English support will be addressed. These two approaches are marked by language emphasis, English or ASL.

A critical review of the English support and ASL support approaches takes into consideration the concept of linguistic accessibility that accounts for the special status of ASL as a signed language (see S. Supalla & Cripps, 2008). The concept of a natural language and signed language structure are included in the examination along with reading methodological issues. The consideration for the UDL principles in regard to the English support and ASL support approaches includes attention to both the cognition and the deaf child's potential for learning. The evaluation of the English support and ASL support approaches ultimately targets their face validity of reading instruction and learning based on decoding and linguistic comprehension concerning deaf children (see Scarborough & Brady, 2002 for the theoretical basis on the reading of hearing children).

**The English Support Approach**

Perhaps the best source for understanding the English support approach in teaching reading to deaf students is *Reading and Deafness: Theory, Research, and Practice* by Beverly Trezek, Ye Wang, and Peter Paul (2010). The book's organization suggests it is intended to serve as a textbook for teacher of the deaf preparation programs. The premise the textbook authors have is: Deaf children can and must learn to read English. The ramifications of the relationship between English as a spoken language to of its written form are absent. While ASL is mentioned in the book, the signed language is treated as simply a language other than English. The status of ASL as a signed language that holds ramifications for linguistic accessibility is not part of the textbook's priorities. The overriding concern the authors have is how deaf children experience English language-based comprehension when reading and have the ability to decode, again in English.

It is necessary to first consider the authors' comment: "…there is no question that language is important for reading. Specifically, it is the reciprocal relation between the conversational (spoken or *signed* [emphasis added]) form of the language and the language of print that is crucial…" (p. 10). At first glance, this seems reasonable and theoretically sound. Reading is inherently tied to language. Should a language be signed, one would immediately think about ASL and how print needs to represent that language. Signed language reading is highly relevant as it takes into account that ASL functions as deaf children's oral language and that there is a "reciprocal relationship" with written ASL, which is what reading entails. ASL gloss is part of this scenario. Yet Trezek, Wang, and Paul (2010) have something different in mind in that "signed" refers to Manually Coded English (MCE). This is where the authors steer away from ASL and focus on English.

True to the special education framework, Trezek Wang, and Paul (2010) treat MCE as 'information'. In their view, deaf children simply need the information and then MCE will provide access to the English language. However, the fact that MCE is not a natural language must be taken into consideration. The psycholinguistic concerns over MCE are abundant and significant. MCE has been described as cumbersome and too lengthy to use (e.g., Klima & Bellugi, 1979; Wilbur, 2011). MCE is not efficient or structurally tuned to cognitive processing via visual perception and manual production. Meeting the cognitive demands that all children and adults possess is how linguistic competence is achieved and maintained. Perhaps the most important research finding lies in how deaf children do not learn MCE as they do ASL. The literature clearly demonstrates any effort to artificially create a sign system based on a spoken language, is futile for the system would break down in terms of learnability and has significant limitations (S. Supalla & McKee, 2002; Drasgow & Paul, 1995; Schick, 2011).

The UDL scholars point out that special education does not emphasize access to learning, as it should. This deficiency causes Trezek Wang, and Paul (2010) to develop and maintain their perceptions without considering what deaf children see in language or even how they best learn language. More problems with special education can be found with Nussbaum, Waddy-Smith, and Doyle (2012). These deaf education experts acknowledge that MCE is not a natural language, yet assert that it can serve as "a support to clarifying English" (p. 312). To be sure, any clarification is helpful, but it should not serve as an equivalent to language acquisition. Deaf children are known for learning and mastering ASL with no clarification needed (Emmorey, 2002; Mayberry, 1993; Mayberry & Eichen, 1991; Mayberry & Squires, 2006; Newport & Meier 1985; Newport, 1990).

Interestingly enough, Trezek, Wang, and Paul (2010) wrestle with making English support work for deaf children as follows:

> Although manually coded English might be effective in introducing vocabulary and syntax of English, they represent English at the morphological level - albeit incompletely - rather than at the phonemic level. Therefore, these systems might not be effective in assisting children in acquiring the beginning awareness of the sound structure of words. Even when combined, speech ('lip') reading and manually coded English can never provide a complete picture of spoken English. Only Cued Speech/Language has the potential to sufficiently represent spoken English at the phonemic level. (p. 32)

In this quote, Trezek, Wang, and Paul (2010) provide a hint about English being a spoken language and is inaccessible for deaf children. They continue to have 'blind faith' in supports, however, and pull in yet another system, Cued Speech/Language. They are assuming additional supports will translate into greater success for deaf children. Yet recall that UDL scholars cautioned about special education's preoccupation with the amount of supports. Quality is a factor, and deaf children must connect to their own language for reading development purposes. The fact that the textbook authors added "Language" to the term Cued Speech only causes confusion over what language really means to deaf children.

A critique of Cued Speech/Language as compared to what is known about signed languages in general will help restore a clear focus on the language issues in deaf education. Cued Speech/Language does not look like a signed language. Deaf children cannot detect words through this system, for example. A typical word in ASL relies on the use of one handshape moving through space, either on the signer's body or in the signing space. The signed word formation properties identified in ASL are also found in other signed languages around the world as well (Sandler, 1999; Zeshan, 2002; Brentari, 2002, 2011). Cued Speech/Language "words" are produced with a sequence of multiple handshapes, and the movement information (that represent certain sounds in English) is restricted in variation as compared to that of signed words. The possible locations on the signer's body are also reduced to the area close to the mouth. A person using Cued Speech/Language may think they are making the phonetic components of English visible (all while the person speaks), but the system does not perform effectively with regards to how words are produced in the signed language modality.

Of relevance is Koo and T. Supalla's (2010) empirical evidence that deaf children exposed to Cued Speech/Language did not acquire the system like they should with any natural language. However, these findings do not stop deaf education experts from having undue confidence in English support. LaSasso and Crain (2015) wrote that Cued Speech/Language "is structurally

capable of affording clear, complete visual access to English" (p. 447). Making English "visual" for deaf children is too simplistic as cognition continues to be the driving force for shaping the language. ASL is also visual, but it is because ASL is a signed language that it becomes real and meaningful to deaf children.

Returning to Trezek, Wang, and Paul (2010), they addressed another system called Visual Phonics, again as if it were a viable option for the education of deaf children (see also Abdulghafoor, Ahmad, & Huang, 2015). This system is somewhat different from Cued Speech/Language. Narr (2008) provides some details on Visual Phonics as follows:

> Visual phonics [constitutes] the visual, tactile, and kinesthetic input related to the phonemic structure of [English] words. Using visual phonics, *complete information* [emphasis added] about the phonologic code is provided at the isolated phoneme and word level, not in communicative contexts. As used with students who are communicating in sign language, visual phonics can be used as a supplemental tool in literacy instruction...The language of instruction can remain manual (via ASL), and the previously inaccessible or partially accessible features of spoken English are rendered accessible. (p. 414)

Narr (2008) recognizes ASL as the best fit for the role of a language of instruction for deaf children, however, the treatment of Visual Phonics as a "tool in literacy instruction" is not correct. For one thing, a written form for ASL could be the long elusive tool for reading instruction, especially with what ASL gloss has to offer. The description of Visual Phonics as providing deaf children with “complete information” is not clear and can be misleading. McQuarrie and Parrila (2009) clarify what is involved with the phonologic code that works for deaf children:

> …the children in [their] study communicate via natural sign language and thus have complete access to the sublexical (sign phonemes) structure of a natural language. This provides an alternate means of coding words and establishing fully specified phonological representations of words as they are learned. (p. 151)

What this suggests is that deaf children are primed for learning to read in ASL. If an alphabetic system is created and provided for the signed language, deaf children will experience learning that is comparable to hearing children with English. This is precisely why the ASL-phabet was developed in tandem with ASL gloss.

Narr (2008) and other deaf education experts need to understand that deaf children are primed to learn a signed language. Deaf children cannot connect to Visual Phonics as a system with 45 hand and symbol cues (that theoretically represent the phonemes of spoken English). Although Narr (2008) demonstrates that deaf children successfully mimicked what hearing children did in phonological awareness and decoding tasks. What is key seems to be the observation that imitating hearing children’s reading performance and is critical for interpreting the study's results. Narr (2008) believes that deaf children performed reading, but they did not. In reality, the deaf children in Narr's study memorized the English phonemes and succeeded in duplicating them, which misled the researcher in a variety of tasks.

Another consideration is how teachers of the deaf who use Visual Phonics in the classroom unwittingly 'teach to the test' (e.g., a statewide assessment that includes phonetic skills in English). This results in a false demonstration of teachers thinking they are teaching English literacy to deaf

students. There remains significant confusion regarding the role of Visual Phonics and its lack of psychological reality with deaf students in terms of reading development (Trezek & Malmgren, 2005; Trezek & Wang, 2017; Trezek, Wang, Woods, Gampp, & Paul, 2007).

McQuarrie and Parrila (2009) provide empirical evidence that the notion of deaf children developing functional phonological representations of English is erroneous. Deaf children are not sensitive to the English phonological structure (for making syllable-, rhyme-, and phoneme-judgments when reading words). Rather, they reported "difficulties with spoken language phonological awareness are not outgrown...and are persistent and pervasive throughout at least adolescence despite intensive and long-term interventions" (p. 150). Cripps, McBride, and Forster (2005) and Bélanger, Mayberry, and Rayner (2013) offer additional evidence of lacking spoken language knowledge and processing among deaf individuals.

**The ASL Support Approach**

While ASL support may be more sensitive to deaf children's needs, especially with language, the reading component of a deaf child remains problematic. English text continues to serve as the basis for reading development purposes with deaf children. ASL support thus emerges as an alternative to English support, which creates a division in the field of deaf education. This contemporary scenario is similar to the age-old battle between the manual and oral camps in the deaf education establishment before the advent of special education (Moores, 1996). The manualists are best described as supporters of ASL, whereas oralists focus on having deaf children speak and lipread in English exclusively. The modern English supports advocates are not as extreme as oralists, but their ambiguity about the signed language remains an ongoing factor to consider.

Worthy of mention is how the world's only liberal arts institution of higher education serving deaf students, Gallaudet University is strongly behind ASL support. There are model demonstration elementary and secondary schools for the deaf that are located on Gallaudet's University's campus. Schools for the deaf around the country frequently have a close working relationship with Gallaudet University. The historical role of Gallaudet University as a bastion for signed language is commendable (see Van Cleve & Crouch, 1989).

The establishment and operation of the National Science Foundation supported Science of Learning Center on Visual Language and Visual Learning (VL2) at Gallaudet University (SBE-1041725) provides some details on what ASL support looks like in the classroom. Garate's (2012) VL2 Center brief explained that "teachers often translate English text into ASL during read-aloud activities..." (p. 4). Garate went on to explain that with ASL support, "the teacher directly links signs to printed information…" (p. 5). This practice is part of what is called 'chaining' or 'sandwiching' (discussed later in this article), which gives educators the idea that they are helping connect ASL to English literacy.

Garate's (2012) view on the appropriateness of read-aloud activities with ASL support must be examined. While reading a book in front of the class is a valuable reading instruction strategy, how it is done is crucial to a successful outcome. What has been set up for ASL support cannot be deemed as good practice as linguistic confusion with reading is problematic. Deaf children see that the English text does not match with how the teacher signs. This significant point of concern is not part of many educators' thinking and accessing the information in the book's story via ASL translation is supposed to be a 'good thing'. Educators who embrace ASL support are likely to

assert that deaf children understand what a teacher is signing and get a general idea of what is written in the book.

The purpose of a teacher leading a read-aloud activity with children must be fully appreciated. Hearing children who participate in the read-aloud activity can listen to the teacher speaking in English. Critically, the book's text linguistically matches with the spoken English. Hearing children thus have the opportunity to observe how the teacher models reading and learn about the importance of reading every word in print. The situation with deaf children and ASL support is, unfortunately, not the same (i.e., the mismatch of English text and ASL) and the learning opportunities as discussed for hearing children are thus lost on deaf children.

It is also necessary to consider special education's additional focus on providing deaf children access to learning activities. With ASL support, it is easy to understand why teachers believe that they help make the read-aloud activity in the classroom 'accessible' for deaf children. However, this is deceiving. With ASL gloss, read-aloud activities are authenticated based on the compatibility of signing and print: a claim that educators cannot make with an ASL support approach.

The role and use of fingerspelling is also an issue with the ASL support approach. Before addressing this issue, it is important to recognize the fingerspelling system's function and relationship to ASL. The English manual alphabet is widely used in the deaf community, which indicates a difference from other systems discussed earlier as English supports (e.g., Cued Speech/Language). The fingerspelling system is made up of 26 handshapes representing the letters of the English alphabet. A deaf individual who uses ASL may spell an English word with the production of different handshapes in front of the signer in the English text sequence. One example is B-R-E-A-D. However, since ASL has a sign for this concept, the fingerspelled version would only be used to communicate the spelling of the English word. In situations where deaf individuals need to express a name of an object or a proper noun, such as brand names (like Nike and Buick), fingerspelling is very useful. It is easy to understand why fingerspelling constitutes a small percentage of all nouns, leaving the larger percentage of nouns as signed words (Padden, 1998).

In addition, some concepts have never been expressed in a signed form, but rather fingerspelled (e.g., T-A-X-I). With these instances, deaf individuals are expected to fingerspell certain English words on a regular basis, but such occurrence is rare. And, although fingerspelled words can become 'lexicalized' involving a particular flow in movement and rapidity of production, they still look different from signed words. Words in ASL are produced employing various locations of the signers' body such as the chin area, the temple area, the shoulder area, the stomach area or in generalized signing space. Additionally, as discussed earlier, all signs involve the use of a basic handshape. In contrast, fingerspelled words employ a series of handshapes all in one location (in front of the signer's body). It becomes clear that fingerspelling is not native to ASL as Brentari and Padden (2001) detail the foreign status of fingerspelled words.

However, a complete understanding about fingerspelling seems to be absent in Garate (2012) and the VL2 Center. Their attempt to boost the 'merit' of ASL support via fingerspelling as a manner in which to decode English words in conjunction with ASL is misguided. Garate (2012) wrote "...the use of both fingerspelling and lexicalized fingerspelling, a morphological process that brings new signs into ASL from their fingerspelling form, have been used to introduce and teach new English vocabulary and to facilitate English decoding..." (p. 5). The morphological process of turning fingerspelled words into signs simply does not exist. The fact that deaf people predominantly sign and use limited fingerspelling cannot be overlooked. There are thousands of signs that have no relationship to fingerspelling. Garate (2012) and the VL2 Center need to

understand that fingerspelled words are unique and stand for themselves as a letter by letter representation of English and not through phonemes or as part of a language. Several other researchers make the same fundamental error (Andrews & Wang, 2015; Easterbrooks, Lederberg, Antia, Shick, Kushalnager, Webb, Branum-Martin, & Connor, 2015; Haptonstall-Nykaza & Schick, 2007). Any reference to "English decoding" must be limited to spoken words being written and subject to reading (and with children who can hear, of course). For deaf children to experience decoding, it must be achieved through signed words that are written and subject to reading.

Herzig and Malzkun (2015) provide a thorough review of the VL2 Center's recent release of VL2 Storybook Apps (http://vl2storybookapps.com) and demonstrate the problem in having ASL support resemble a reading instruction approach. This includes examples of the 'pseudo decoding mechanism' of chaining. For the purpose of this article, one English story, *The Baobab* is subject to critique for the purpose of this paper. Please understand that the text for this story will be critiqued. With the VL2 Storybook App, if a deaf child encounters a word in print that is unfamiliar, the child can click the individual word, and a video of an adult signer appears on the screen. The chaining for the English word 'little' looks like:

1) Sign the ASL equivalent
2) Fingerspell the word (e.g., L-I-T-T-L-E)
3) Sign the ASL equivalent again

These steps are required for the deaf child to identify the unfamiliar words in *The Baobab* story. According to the ASL support approach, all signs should be fingerspelled and chained to ASL and serve as the decoding mechanism for deaf children. The problem is that the deaf child understands the meaning of a word based on a translation, not on decoding. In this example, the use of fingerspelling occurs after the word has been unsuccessfully read by the child. If a word is not understood, it is then translated or signed in ASL, then fingerspelled and subsequently translated into ASL again. This process hopefully enables the child to 'read' the word in print.

ASL gloss is the only avenue in which deaf children can experience a true form of word decoding, as they have the opportunity to read signs written in the ASL-phabet. Imagine a deaf child reading the glossed sentence example, DOG NOW CHASE>IX=3 RABBIT. This child may recognize all sight words and sign them all except RABBIT. If the child does not recognize the word, the act of reading is halted. The next step would be to click on the word RABBIT and read the ASL equivalent ǁ ǁ ≈и Э. The child is then able to visually 'sound out' the written sign and can connect it to the sign that he or she knows. The child is now able to comprehend the sentence because of successful decoding.

What remains unevaluated is text manipulation in the context of ASL support. Gallimore (2000) reported on the use of color cues imposed on English text to help deaf children navigate in reading English. The text however, is still English with no way manipulating the English text to make it ASL-like. According to Gallimore (2000), the teacher must color code the reading materials in blue, green, yellow, and other colors depending on how the English text relates to the ASL structure. The manipulated text represents the similarities and differences between ASL and English at the word and phrasal levels (see Schimmel, Edwards, & Prickett, 1999 for a similar text manipulation attempt with what is called "Fairview Learning").

To demonstrate this point, since there is no ASL equivalent, the phrase "By this time…" would be coded in red as it needs an expansion. Deaf children reading the phrase and seeing this cue will likely know that an expansion is needed, but it is the teacher who has control over the text

and must tell students about the expansion. In addition, other words coded in green may have an ASL equivalent such as "house" and "see", yet they are not decodable. The teacher has to demonstrate the ASL signs by showing the sign equivalents through a translation for deaf children.

Once again, the situation with ASL gloss is different as deaf children have full control over the text. Recall the RABBIT sentence example, and the use of decoding as an empowering act for deaf children. Teachers who are trained in ASL gloss understand that deaf children must not develop a dependency on them for the identification of English words. In other words, children must learn to read signs written in the ASL-phabet and use the RB. Reading any glossed book is also liberating for deaf children as the text itself is consistent with how ASL operates morphologically and syntactically.

It warrants exploring how deaf children are assessed for their reading skills through ASL support. With the running record, a number of deaf education experts (e.g., Chaleff & Ritter, 2001; Easterbrooks & Huston, 2008) advocate examining deaf children's signing ASL while reading in English. Bailes (2001) even suggests having deaf children translate while reading English, which is erroneously deemed as an appropriate form of 'oral reading'. There are potential problems associated with having deaf children translate English text as part of their 'reading' development experience (Cripps, 2008).

With ASL support, a deaf child reading an English text needs to produce the best possible translation in ASL to demonstrate a level of 'reading' performance in English via the running record. Conceptual accuracy helps with measuring deaf students' 'reading' performance and good translation skills are measured through a high equivalence of concepts between the languages. The problem is that translation is not the same as reading. Early on, Stewart and Kluwin (2001) took up the position and stated that doing a running record with deaf students through translation will undermines the validity of any reading fluency assessment.

Yet, as part of a large scale reading research project with the deaf student population in the United States, deaf education experts, with support from the Institute of Education Sciences, U.S. Department of Education, (Easterbrooks et al., 2015) make testing plans as follows:

> *Reading Fluency Assessment*. In this assessment, [deaf] children must read (using...sign language) three [English] passages (from Engelmann & Bruner, 1995...) within a prescribed time...The child's reading is video-recorded and later rated by means of a miscue analysis. Words per minute and correct words per minute are also calculated. The child is also rated on performance using the *Signed Reading Fluency Rubric for Deaf Children* when appropriate (Easterbrooks & Huston, 2008). (p. 426)

The intentions as described are clear about having deaf children translate the English passages and their performance is assessed for reading skills at the same time. The mention of a measure for examining signed reading fluency among deaf children is worthy of elaboration. The name of the measure 'signed reading fluency' is misleading as it suggests that deaf students' performance is focused on reading; however, it is actually a translation task. A more accurate methodology includes administering a running record that includes glossed passages and have deaf children read the passages and sign in ASL (including the use of the RB as needed). It is only through an ASL text that the accuracy of reading words and sentences reflects an accurate assessment, and the concept of signed reading fluency would be appropriately pursued.

## Discussion and Conclusion

In reviewing all of the different considerations for supports in teaching reading to deaf children, problems for both instruction and assessment become apparent. The importance of recognizing that English text is restrictive for deaf children cannot be emphasized enough. Deaf children must have the opportunity to learn to read which is best accomplished through signed language-based texts accessed through ASL gloss. Both English and ASL support approaches are plagued by problems because of the use of English texts. In addition, with English support approaches, special education holistically fails to address the serious implications of using spoken language with deaf children. This includes not taking into consideration the concept of linguistic accessibility and the status of ASL as a signed language. In theory, reading becomes unattainable with no working or natural language in place.

With ASL support, teachers of the deaf have their hands tied by their special education training. Such teachers cannot venture into signed language reading or ASL gloss, as it means the use of non-English text. Subject for discussion later, such supports would cease to exist when deaf children can read in their own language. This offers as a plausible explanation for the common practice of teachers settling on the practice of translating books into ASL for deaf children. Reading is deemed as a 'hearing thing' in this context and obviously a wrong perception, but has been widely spread among teachers of the deaf (S. Supalla, et al., 2017). The default ideology is deaf children have reading difficulties and must be provided with the information through translation. Thus, deaf children receive support from ASL and become part of the flawed special education framework.

For clarification, the Arizona charter school, where ASL gloss originated, included some translation, but it was done differently than what is reported for the ASL support approach. For example, at the Arizona charter school, a limited but specific type of translation which changed regular books into glossed books was used. The interlinear translation practice at the charter school falls in line with the Universal Design for Learning framework. Ralabate (2011), a prominent UDL scholar, explained that translation constitutes a vital way of manipulating text. Deaf children end up reading a much needed ASL-like text. With the glossed books, there is no need to support deaf children because the text is already accessible and facilitates deaf children's learning. A plan for learning and curriculum supports the ASL gloss approach and actually works *around* the curriculum. This is a big difference. Again, ASL gloss is not just designed for reading in ASL, but for deaf children to have an effective means of transitioning to written English as their second language.

The current situation for the education of deaf children in the United States without ASL gloss is dire. Extensive reviews of the literature on reading research in deaf education have concluded that the criteria, or level of evidence, for the literacy recommendations is limited or lacking (i.e., Easterbrooks, 2010; Guardino, Cannon, & Eberst, 2014; Luckner, Bruce, & Ferrell, 2015; Schirmer & McGough, 2005; Trezek & Wang, 2017). The fact that these findings are in the context of the English and ASL support approaches is not surprising.

Why are supports so important to special education? It is interesting that the notion of 'support' has an affiliation with the field of mental retardation (Wehmeyer, 2003), which in itself has implications for the education of deaf children. It is plausible, because of special education's obligation to serve all children with disabilities, including those with cognitive impairments, that the consideration for cognition may unintentionally be grounded in deaf education. Historically, cognition was once used against children who suffer a cognitive impairment as they would not

experience any schooling, for example. This has clearly changed with the advent of special education (Gargiulo, 2009). Supports understandably become attractive by providing information and activities and children with cognitive impairments are given a chance to participate in the education process. While deaf children as a group are not considered cognitively impaired, they appear to be victimized by the lack of attention to their cognition.

In any case, the priority for this article is to develop more exact understanding deaf children as a group. Only after addressing the learning needs of deaf children, can any beneficial systematic change in American education can happen. There are other significant issues associated with special education that need to be investigated as well. For example, special education's emphasis on the individualized education design has implications for ASL gloss. It is easy to imagine that the needs of deaf children as a group are not valued when educators focus solely on individuals, for example. What seems clear at this point is that deaf children as a group have common needs. Among these are key concepts for realizing best practices for teaching reading to deaf children include: 1) Status of ASL as a signed language; 2) Significance of text manipulation; and 3) ASL gloss as an effective methodology.

For the future, some scholars have urged for a model of signed language education that serves as a new extension of special education (e.g., Cripps & S. Supalla, 2012; Padden, 2003; Padden & Rayman, 2002; Rosen, 2017). This may allow for the creation and formalization of Kindergarten through 12th grade education that incorporates ASL as the language of instruction. At present, deaf children desperately need an effective way to learn to read English texts and ASL gloss is poised as a reading instruction approach that is sensitive to the linguistic comprehension and decoding needs for the education of deaf children. One way or another, all children, with or without disabilities, deserve the opportunity to become fluent readers and to achieve that, attention needs to focus on best practices for deaf children and learning to read.

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# Groupthink Revealed in Deaf Education Research

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Cawthon, S. W., & Garberoglio, C. L., Eds. (2017). Research in deaf education: Contexts, challenges and considerations. New York, NY: Oxford University Press. Hardcover. 424 pages. $88.00

As I reviewed the textbook, "Research in Deaf Education: Contexts, Challenges and Considerations," memories of my own doctoral studies more than 20 years ago flooded to the forefront of my mind. I recognize in this textbook the names of former professors, classmates and colleagues who either co-authored a chapter or whose research was cited as an example of "best practice in deaf education research."

I began my doctoral studies at Gallaudet University after working as a deaf educator for 8 years. I recall experiencing cognitive dissonance during the first two years of my program. My doctoral cohort consisted of several others who had served as deaf educators. Early on, we frequently engaged in lively debates about the purpose of research methods and how our future investigations could improve learning experiences for deaf students on a broader scale. During these conversations, we struggled with the juxtaposition of remembering our former students' learning styles while searching for evidence of effective teaching strategies in the deaf education research literature base. As time wore on, my cohort's lively discussions quieted as we set out to answer focused questions about our unique dissertation research. For me and for members of my cohort, equilibrium was reached.

This textbook mirrors my doctoral program. It appears the editors of this textbook achieved their purpose: To create a collection of writings that guide beginning researchers to work from the "germ" of an idea or hypothesis toward the final achievement of publishing replicable findings that contribute to the academic community at large. Unfortunately, in its essence, this collection of chapters is confirmation of the phenomenon of *groupthink* in deaf education.

## Groupthink: Revealing the Elephant in the Room

Irving Janis' seminal work on group dynamics (1971) aptly coined *groupthink* as, "a quick and easy way to refer to the mode of thinking that persons engage in when they are deeply involved in a cohesive in-group, when members' strivings for unanimity override their motivation to realistically appraise alternative courses of action." Cawthon and Garberoglio establish several groupthink arguments in this textbook's introduction that demonstrate in-group behavior among these researchers in deaf education. Once revealed, like the proverbial "elephant in the room," these arteries of in-group thinking are apparent and established throughout each chapter of the text.

*An Epistemological Context for Research is Inappropriate (p. x).* The groupthink concept of Epistemological Context is most prevalent throughout this textbook and the profession. Moores (Chapter 2), Graham and Horejes (Chapter 3), Enns (Chapter 10), Antia, Guardino & Cannon (Chapter 11), Trezek & Wang (Chapter 13), and Paul & Wang (Chapter 16) particularly, make the case that researchers must "position" themselves to sort through individual variability in order to create a standardized research lens. These views lead to a popular modern academic "elephant in

the room" that maintains research in Deaf Education is rarely replicable because deaf people are "special" or part of a special education system. This exceptionality model creates a population of deaf students that are at risk of going unreported. Consequently, deaf students are characterized as too small and heterogeneous a group for standardized scientific study.

It was this concept that confused me the most as a K-12 educator turned doctoral student, and continued to baffle me until I engaged in postdoctoral research at the University of Arizona and in a charter school setting. As a deaf educator, my teacher colleagues and I implemented a "Universal Design" modus operandi of teaching before the term was coined. I found myself in a wider scope of research where I could see best teaching practices in action when they addressed deaf students as a group. Most astounding for me to this day is how hearing students could benefit from the education of deaf students, which was the case in the Arizona charter school. The teachers of the deaf out in the field do not have this opportunity. This means that faced with the obstacle of having no "working curriculum," teachers working with deaf students resort to making do with the customary academic standards via the individualized education plan, or IEP. Strong and clear guidance from the deaf education establishment is much needed.

*Established Academic Writing Conventions Should be Retained and Built Upon (p. xv)*. Cawthon & Garberoglio establish in-group guidelines early in the textbook, determining that academic writing conventions that describe deaf students' worldviews are, "both cumbersome, and at times, nonsensical" (p. xvi). The editors also conclude that cultural identity is fluid and should not be assumed by using English print conventions (i.e., persons who are medically deaf versus culturally Deaf persons). Admittedly, I agree with their observation to a certain extent and have had similar discussions within my own circle of researchers. My concern is that while setting the stage for this textbook, the editors and authors determined that rather than objectively determine alternatives and options that build upon or explain standard writing conventions, they unilaterally discarded standard scientific practice that is observed beyond the field of Deaf Education to avoid addressing discomfort or disharmony during the publishing process. When I read this information in the textbook, I immediately lost trust as a reader in the works to follow.

*Deaf Education Research is Not Educational Research (p. xiv)*. Deaf Education research not nestled within Educational research overall is most unsettling for me. The first statement in this textbook is, the subject matter addressed therein was originally declined as a panel presentation proposal for an Annual Meeting of the American Education Research Association. On the contrary, Deaf Education research if rooted at all, can be found within the fields of Communication Disorders, Special Education and Educational Psychology. Considering the authors' departmental affiliations and research background provides important insight into the worldviews of the authors who contributed to this textbook.

For example, Trezek and Wang (Chapter 13) attempt to implement randomized experimental design (considered the Council of Exceptional Children's "gold standard of educational research design" for hearing children with special learning needs) to determine what effective reading instruction should look like among deaf student populations. The outcome of their literature examination resulted in an inclusion criteria that eliminated students instructed in American Sign Language:

> *Studies reported the result of intervention research investigations that were conducted in English were targeted for this review… Studies were excluded if the intervention did not specifically target reading instruction such as those that taught poetry or vocabulary in American Sign Language…* (p. 282)

These types of reporting strategies reinforce the in-group belief that manipulating research data is acceptable (and ethical) because Deaf Education Research is distinct and researchers in this profession should be permitted to be conduct their work using special criteria. This textbook cements the dichotomy that Deaf Education Research is Educational Research, yet, at the same time, posits that special circumstances and manipulations are permitted because deaf students are part of an exceptional population. We cannot accept both standard and variable means of reporting information.

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# Dandelion: A Personal Response

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*"They tried to bury us, but they didn't know we were seeds." -N. Christianopoulos (in Ponders, 2016)*

In the relatively brief time since ASL and ASL literature have been valorized, a small number of ASL poems have become part of our developing literary canon. One these cherished and well-known ASL poems is Clayton Valli's, *Dandelion*. In fact, the poem has inspired Deaf artists to incorporate dandelions as a motif in a number of De'VIA artworks (see https://deviacurr.wordpress.com/devia-motifs-d-g).

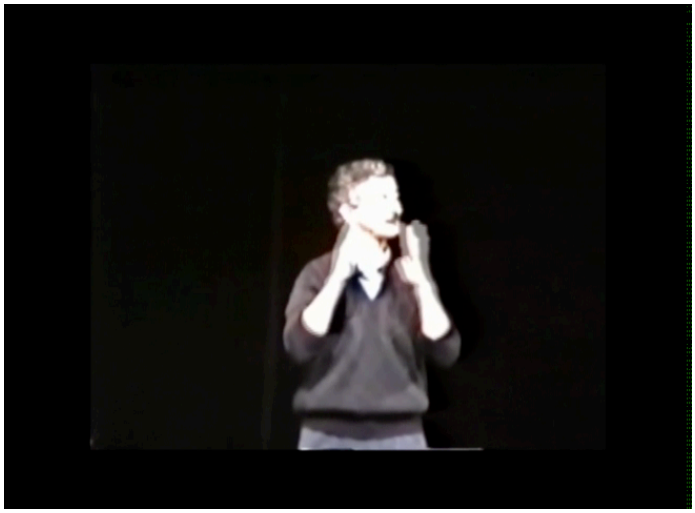
I remember clearly the first time I saw Clayton Valli perform the poem, *Dandelion*. As the poem ended, there was this surge of feeling that rose up from my center to my eyes. There was an overwhelming sense of… what? Hope? Pride? Triumph? The poem and the feelings all happened so fast; I really did not understand why I reacted as strongly I did. When the poem later came out on video, I was able to watch it carefully, looking for possible ways the poem worked and how it sparked the emotions that it did. By studying this poem, we can begin to unearth the power of ASL poetry.

Videoclip #1[1]
(https://www.youtube.com/watch?v=tnRB6XWxIaA)

The beginning introduces us to a peaceful and pastoral scene. The sunny flowers and light breezes draw our attention to nature. Because the dandelions are moving in unison, there is a feeling of community. If the symbol of dandelions represents Deaf people, then the poem affirms that Deaf people are natural organisms. Valli, as well as other Deaf poets, have chosen symbols from the natural world to represent Deaf people such as trees, mushrooms, and flowers to communicate that we are a natural part of human diversity. In addition, the Deaf cultural value of collectivism is reinforced in the description of a field

[1] The author's descriptions as well as ASL-to-English translations for the first three videoclips can be seen at the end of this paper.

of dandelions. The relaxed mood expressed at this point in the poem is akin to that of when we Deaf folk are among our tribe, in a community setting, just comfortably chatting and shooting the breeze in our language.



Videoclip #2
(https://www.youtube.com/watch?v=JQP_kNzCT2c)

Suddenly, our pastoral scene is violently interrupted. The intruder judges the dandelions as undesirable, and worse, worthy of complete destruction. Traditionally, dandelions have been used as natural sources of medicine and vitamins. They are often used in salads as well as in the creation of teas, fermented wines, and honey. They are an important part of our ecosystem. Dandelions only become undesirable weeds in the quest for a perfect lawn.

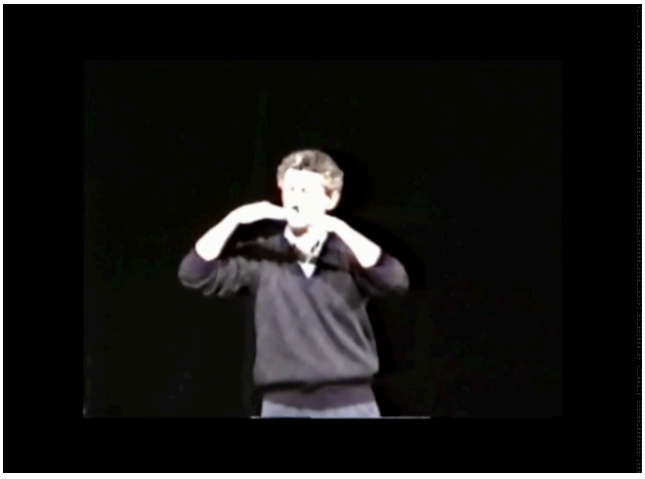
Given that the eye gaze from the dandelion to the "man" is upward to a place of power, the "man" is perhaps, more specifically, "The Man." As a slang phrase, "The Man" can refer to the dominant establishment in power, those who authorize oppression. Thus, "The Man" in the poem has the power to define dandelions as WEEDS rather than flowers. Some believe that "The Man" in the poem, who uses speech and not sign, refers to Alexander Graham Bell. Because of his wealth, power, and status as an inventor, his ideas about Deaf people and our language were extremely influential. And his ideas were eugenically-minded---that Deaf people should not use sign language, should not attend Deaf schools, should not become teachers, should not pass on Deaf genes---as all would lead to "a defective variety of the human race… a Deaf variety of the human race." (Bell, 1884, pp. 3-4). Bell defined Deaf humans as DEFECTIVE rather than contributing members of the human race.

In 1920, another man, Frank W. Booth, a pure oralist and superintendent of Nebraska School for the Deaf, described ASL a "weed language." Specifically, he said, "The sign language is a weed language; it grows naturally and, if allowed to do so, it crowds out any and every other desirable growth. Now, we properly keep weeds out of the farm or garden when we plant and cultivate things that we wish to grow. And that is what we must do in our schoolrooms where we are cultivating, developing the English language; we simply must keep the sign language out…" (American Instructors of the Deaf, 1921, p.

231). Thus, not only we as a people, but also our languages, were viewed as undesirable WEEDS.

Unfortunately, these are not attitudes that were left behind in the dark ages of oralism. While the man is dead, the Alexander Graham Bell Association still exists working to deprive young Deaf children of sign language using the soft language of "communication options, hearing technology and treatment of speech and language problems" (see https://www.agbell.org/). Advances in genetic engineering, stem cell research, early hearing testing and surgical intervention, DNA manipulation, practices in genetic counseling and legal restrictions concerning who can donate for In Vitro Fertilization all call into question the right of Deaf people to exist. (See Durr's 2011 blog series on the Right to be Deaf and Rourke's 2011 series of artworks of the same title). Thus, we may be a natural part of human diversity but through these actions it is communicated that many believe our kind should be eradicated. The smooth lawn, a symbol of genetic purification, shows what a genocide looks like. Recognizing this is painful.

One powerful experience I had waking up to audism was related to the early experimental cochlear implant surgeries. A group of us learned that back in the 1980s there was a Food and Drug Administrative panel that reviewed pediatric implantation practices and one of those involved was willing to be interviewed (see Witteborg, 2014). Dr. Laura-Ann Petitto, who participated in this panel and is now the director of Brain and Language Laboratory at Gallaudet University, explained that the panel was set up because twelve Deaf children had died as a result of these early experimental surgeries. Twelve Deaf children! That was unimaginable to me! Twelve Deaf children, whose parents felt that living a Deaf life would be so tragic that it was worth risking their lives for an experimental surgery. For a long time I wondered, who were these Deaf children? Who were they? What were their names? What might they have contributed to our community? Imagine twelve empty chairs at the next Deaf gathering you attend. When we become witnesses to tragedies such as this, what can we do? It is a powerless feeling, but sometimes poetry helps.



Videoclip #3
(https://www.youtube.com/watch?v=FWMV4ZxWu8I)

Because of the natural elements of the rain and sun, that have greater power than "The Man," a dandelion has risen up once again and continue to blossom. This dandelion,

from a new generation, has had more time to mature from a flower into a puffball. In contrast, "The Man's" violence is carelessly impulsive and he realizes too late that it causes the seeds spread--ensuring his defeat and our victory. And understand that the victory has come because of one dandelion.

There are a number of reasons the end of this poem is amazing. If a yellow dandelion can shape shift into a white puffball, what is our magic as Deaf people? What is our special power? This brings to mind an African American folktale called *The People Who Could Fly* (Lester, 1969). This fantasy tale is about one enslaved African who helps the others remember magical words. These words were forgotten in the trauma of being forced to leave Africa. As they rediscover the words and say them, they fly free, back to their homeland. Do we carry magic in our Deaf genes? Our language? Or is it in the fact that when threatened, we discover our powers of resistance?

Back in 1920, Deaf folks did address Booth's quote about sign language as a weed language. During the National Association of the Deaf conference that year, the Association adopted "The Weed Language" resolution: "*Resolved*, That we condemn in the strongest terms the attitude assumed by Mr. Frank W. Booth in his public declaration at the recent joint convention of teachers at Mt. Airy that 'sign language is a weed language that should be eradicated,' and that we consider anyone who seeks to deprive the Deaf of the language of signs an enemy to their interest and happiness" (Roberts, 1920, p. 99). The documentation of this attack on our language, and their response is impressive while also demonstrating that they knew something about language deprivation even back then.

But what is most amazing about the ending of this poem is how Valli's facial expression changes with the scattering of the seeds from the dandelions. Valli's initial expression is that of "The Man;" that is, his face shows disgust at the spreading of the seeds. However, in the last seconds of the poem you can just perceive in Valli's face the shadow of a peaceful smile. Just a sliver of smile, but it is there. It blows my mind every time. It is as if he is assuring us of the value of even one Deaf person who takes a stand. Veditz has proclaimed, "As Long as we have Deaf people on Earth, we will have sign language" (Veditz, 1933). Here, Valli has promised that as long as there are those who don't want Deaf people on Earth, there will be at least one Deaf person who will resist. Alice Walker (1997) said, "Resistance is the secret joy" (p. 281). And right there she has named that overwhelming feeling I had the first time I saw Valli perform this poem. Further, the power of ASL poetry is highlighted by the fact that Valli is able to condense the feelings of being an undesirable defective to joy in less than a minute and a half.

The poem*, Dandelion*, thus, becomes a work of ARTivism. In other words, Clayton Valli was an activist who advocated for social justice through his poetry. In a great number of his poems, Valli addressed the oppression of ASL, institutionalized audism, forced social assimilation of Deaf people, and the medicalization of Deaf identity (see Christie and Wilkins, 2006 for a further discussion as well as Luczak's English translation of *Dandelion* and *Pawns* in Valli, 2009). He was one of the first Deaf people to call attention to the impact of AIDS on the Deaf community. In addition, his poetry celebrated the beauty of ASL, and the value of future generations of Deaf people.

The Hearing Basque poet Miguel de Unamuno (1993) wrote "to live is to work, and the only thing/which lasts…Throw yourself like a seed as you walk,/and into your own field" (p. 234). Clayton Valli's groundbreaking contributions as an ASL poet and researcher of ASL poetics are the work of a precious life that will last. In the image of

Clayton Valli that remains with me, he stands on stage in the closing seconds of his performance of the poem, *Dandelion*. Those brilliant blue eyes look out at us and that secret smile barely appears before he drops his hands. In that final second, he is reminding each of us that we carry within us, those magic seeds.

**ASL Poetry of *Dandelion* – Original Version**
(https://www.youtube.com/watch?v=Xw41nzlf3xA)

**Translations/Descriptions**

Videoclip #1 - The poem, *Dandelion*, opens showing an expanse of yellow dandelions with Valli's dandelion body and hands rhythmically flowing back and forth as if in a breeze. His facial expression tells us this is a typical dandelion day and his eyes look around in calm acknowledgement of his fellow dandelions.

Videoclip #2 - Then, the dandelion briefly freezes, looking upward to the left as someone, identified as a "man," enters the scene. The man looks down, disgustedly, and yells "DANDELIONS!" Thereafter, he begins tearing the dandelions out by the fistfuls, and later mows them down until he has a smooth green lawn.

Videoclip #3 - As days pass by, days of sun and rain, a single dandelion cautiously sprouts up from the green lawn. The dandelion begins to grow tall and looks about to its left and right. It blossoms into a yellow flower and begins to dance back and forth in a gentle wind. A bee visits carrying off sweet pollen. The flower opens and closes in rhythm with the darkness and light of the days swelling into a white puffball. Bits of its fluff drift off to the left and right. The man returns, shouting THERE, incensed to find the white puffed dandelion. The dandelion stands its ground still defiantly swaying. The man grabs the dandelion, ripping it out of the ground. Horrified, he watches as the white fluff drifts across the field. There, the dandelion has scattered, a multitude of seeds.

**Acknowledgments**

All of Valli's *Dandelion* videoclips in this article are courtesy of RIT/NTID Deaf Studies Archive CLIR GRANT Project. This project is supported by a Digitizing Hidden Collections grant from the Council on Library and Information Resources (CLIR). The grant program is made possible by funding from the Andrew W. Melon Foundation.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# Six Not-So-Great Messages Found in A Quiet Place – A Film Critique

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**SPOILER ALERT: The following contains some plot details about *A Quiet Place*.**

To start, let me say I am thrilled that *A Quiet Place* features the endearing young Deaf actress, Millicent Simmonds, in one of the lead roles. Too many Hollywood productions fail to cast Deaf actors for Deaf roles, so it is refreshing that producer and lead actor John Krasinski insisted on casting a Deaf actress in this movie. It is also wonderful to see ASL on the big screen. Even though I wasn't able to watch an open-captioned showing of *A Quiet Place*, it is an easy movie to follow without much reliance on captioning devices.

If I didn't want to think too deeply, I would agree with all of the positive reviews and comments about how novel and thrilling the movie is. It could be a blast to go and watch simply for the sake of getting scared. On a surface level, it is a fun horror movie.

I can't in good conscience say nothing, however, about what I find problematic and exasperating about this movie.

Here are the six not-so-great messages found in *A Quiet Place*:

## 1. ASL is a last resort.

In the movie, ASL is portrayed as a last resort means of communication in a worst-case scenario. ASL is not used by choice. It is a feature of the movie's dystopian setting, the only option for survival in a very negative situation where people will get killed by terrifying creatures if they make noises. Luckily, the Abbott family already signs because their daughter is Deaf. In the framework of a dangerous and frightening world, ASL becomes a benefit to them.

Unfortunately, signing in a bad situation parallels the real-life scenario that is all too common: ASL being presented as a communication option for Deaf babies and children only as a last resort (Hall, 2017). Medical professionals and so-called education experts usually discourage the use of ASL among Deaf babies and children. This is done out of the incorrect assumption that spoken language development will be impaired if ASL is used. Only when all other options fail, do many Deaf babies and children receive exposure to ASL. When they finally are allowed to sign, the effects of language deprivation have already made their mark.

The movie misses an opportunity to show ASL in a more positive light, as a chosen language with many benefits.

## 2. ASL is only good for basic communication.

The movie does not show ASL as a full language that is useful beyond crises. Most of the signing is limited to basic communication. Characters turn to speaking when their conversations become deeper. For instance, the father would sign "no", "stay" or "be quiet" to his son, but they would speak to each other when discussing whether the father has told his daughter he loves her. Even if this difference in language usage may have been unintentional, it subtly links ASL with primitive needs and voice with more abstract conversations. In the movie, the siblings play a board

game in silence, suggesting that ASL does not allow for the interesting conversations people typically have while playing games. In reality, Deaf people carry on full and animated conversations in ASL.

**3. It is awfully scary to be Deaf, to use ASL, and to live in a silent world.**

Most hearing people are understandably afraid of not being able to hear or use their voices and of having to use other communication methods instead. *A Quiet Place* becomes a successful horror movie by taking advantage of this fear, incorporating it with other scary elements to ramp up the fright factor. This perpetuates hearing people's fear of being Deaf and using ASL when neither is as scary in reality.

**4. Deaf people are vulnerable, dependent and dumb.**

The Deaf character in this movie is a young girl who, due to being Deaf, is particularly susceptible to being eaten alive by the terrifying creatures who lurk in the shadows, ready to pounce on anyone who makes a noise. In one scary scene, the camera follows her as she walks through a field, unaware that a creature is stalking her. She has to rely on her hearing family members to alert her to the creatures' presence. She is also the one who indirectly "caused" her younger brother's death because she gave him the rocket toy that made noise and attracted one of the creatures who ate him. Even though she did not give him the batteries, had she not given him the toy in the first place, he would still be alive. Her brother might have contributed to his own death, but in the end, she is still at fault.

The movie chose to focus on the Deaf girl's missing sense completely and blow any perceived dangers out of proportion, while leaving out the unique benefits associated with being Deaf. Research shows that Deaf people have quicker reaction times to moving stimuli in the periphery and are more accurate when it comes to discriminating differences in angle of motion and direction than hearing people (Hauthal, Sandmann, Debener & Thorne, 2013). These vision-related advantages could easily have translated into useful contributions made by the Deaf girl in helping her family outwit the creatures. Instead of making the whole movie about how the Deaf girl struggles to fit into a hearing-centric world, it would have been more enlightening to show the positive aspects of being Deaf.

The only time the Deaf girl actually makes a significant contribution is when she uses her squealing cochlear implant to outdo the creatures. In a bizarre twist, the cochlear implant functions as a miracle, even though it is defective. What a message: cochlear implants are great, whether they are broken or not. If the movie manages to pull off such an unrealistic presumption, it sure can do something similar to present the Deaf girl as a strong character who is more than capable of contributing to her family's survival.

**5. Deaf people need to be fixed.**

Fixing the Deaf girl's hearing with a cochlear implant is a huge theme throughout the movie. The father works in secret to repair broken implants for his daughter. These cochlear implants become a symbol of hope. Near the end of the story, the daughter finds her father's workspace full of cochlear implant devices and tools, which illustrates how much he loved her. Of

course, seeing the father's love for his daughter is touching, but it comes at the expense of emphasizing the need to "cure" Deaf people.

It is important to acknowledge the fact that the Deaf girl's parents' ASL also reflects their love for her through ensuring she acquires full language access. This, however, is not a point that is highlighted or used to evoke warm feelings from viewers like the cochlear implants succeed in doing. It is especially ironic, as language acquisition is a guarantee with ASL, and not so with cochlear implants.

**6. Cochlear implants are instant lifesavers.**

The movie implies cochlear implants save lives, whether through making Deaf people hear or acting as heroic destroyers of the creatures that are terrorizing the world. This romanticizes the idea of cochlear implants, framing them as quick, miraculous solutions to the perceived problem of being Deaf and the actual (in the movie) problem of fending off deadly creatures.

The reality is the opposite. Cochlear implants do not function as artificial ears that provide perfect hearing ability. They do not work like glasses do for most people who wear them. Deaf people who receive cochlear implants must endure long hours of auditory-verbal therapy (AVT) and practice constantly before a minimal percentage finally benefit from them (Humphries et al., 2012; also see Snoddon, 2008 for the push of AVT in current society).

It is hard not to wonder why cochlear implants are portrayed in such a super-heroic way in this movie. The cochlear implant industry earns a great deal of money by exploiting hearing people's, especially parents', fears and ignorance about Deaf people. While the implants may work for some people, they most definitely do not work for many others. This movie, however, frames them otherwise.

The irony is that ASL is actually a valuable tool for early language acquisition, acting as a lifesaver for many Deaf individuals.

Now that you know these not-so-great messages in *A Quiet Place*, you may not think they are major issues. However, they do shape what hearing people think of Deaf people. Some viewers may go on to have Deaf babies in the future. When they find out their baby is Deaf, their negative reactions, thoughts, and feelings may be subconsciously influenced by this movie. Having a Deaf baby does not have to be as terrifying, but unfortunately movies like *A Quiet Place* perpetuate this nightmare. Remembering this movie and its misleading messages, parents may react out of fear and do everything to make their child not Deaf, such as opting for cochlear implants and no ASL. This is never the best option for their Deaf child though, since every Deaf baby should be provided full access to ASL, a visual-gestural language that comes naturally to Deaf people.

Yes, we can be happy that *A Quiet Place* cast a Deaf talent and made ASL visible on the big screen. At the same time, we need to consider the other messages, both subtle and loud, that the movie sends about Deaf people.

Addendum: Many people who reacted to my post, mentioned how ironic it is that while the movie captioned all conversations in ASL for non-signers, it did not caption any conversations in spoken English for Deaf individuals. I thought this is another point worth considering.

## References

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